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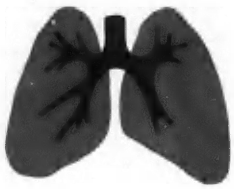

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An Evaluation of Cesarean Section

T. R. NANNINGA, M.D., *Alhambra*, and HENRY A. STEPHENSON, M.D., *San Francisco*

SUMMARY

The risks of cesarean section have been reduced in step with the increase in safety of all major surgical procedures.

In a series of 13,153 deliveries, 1,265 (9.6 per cent) were by cesarean section. There were three obstetrical maternal deaths in 11,888 cases in which delivery was by the vaginal route—0.025 per cent. In the series of 1,265 deliveries by cesarean section there was one death attributable to the operation —0.08 per cent.

The total uncorrected fetal loss following cesarean section was 3.8 per cent. This compares favorably with fetal loss of 3.2 per cent in the vaginal delivery group in this series, and with fetal loss rates reported from large obstetrical centers.

Anesthesia by spinal injection is the method of choice in cesarean section. There were no maternal deaths or accidents attributable to spinal anesthetic, and in no case was it felt that fetal death was attributable to it.

The incidence of maternal morbidity in the cesarean section group following spinal anesthesia was 15.8 per cent—less than half the incidence of morbidity following inhalation anesthesia.

THAT the employment of cesarean section has increased steadily in the past decade is evident from the published statistics of obstetrical services at various hospitals throughout the country. To justify this trend, the results obtained must be comparable to or better than those hitherto considered acceptable.

The present survey covers a series of 1,265 consecutive cesarean sections carried out on the obstetrical service of the Children's Hospital, San Franciso, between January 1, 1943, and December 31, 1948. As the total number of deliveries in that period was 13,153, the incidence of cesarean section was 9.6 per cent. These operations were done by 43 physicians, including resident staff members and 15 certified obstetricians. Ninety-five per cent of operations were on patients received in private practice. The incidence of various indications which led to cesarean section is shown in Table 1.

Presented before the Section on Obstetrics and Gynecology at the 79th Annual Session of the California Medical Association, April 30-May 3, 1950, San Diego.

Cephalopelvic Disproportion and Contracted Pelvis

Patients with absolute contraction of the pelvis or with obvious disproportion were delivered by elective cesarean section. Those with borderline contraction of the pelvis were as a rule permitted a trial of labor. It is in the group of patients with borderline contraction of the pelvis that there should be critical evaluation as to the advantages which abdominal delivery may have to offer. In prolonged difficult labor and difficult operative deliveries by the vaginal route, the incidence of fetal mortality and of maternal morbidity and trauma is high. Cesarean section offers the mother as much safety as

TABLE 1.—*Indications for Cesarean Section*

Indication	No. of Cases
Cephalopelvic disproportion	398
Previous cesarean section	392
Placenta previa and premature separation of placenta	85
Toxemia	77
Elderly primipara	76
Breech and other malpresentation	75
Uterine inertia	41
Pelvic tumors	23
Fetal indications	19
Previous stillbirths	15
Miscellaneous	64*

*Previous vaginal operation, 14; failure to deliver with forceps, 12; medical indication, 12 (diabetes, 6; rheumatic heart disease, 4; asthmatic state, 2); cervical dystocia, 11; previous myomectomy, 9; Rh-negative with titre, 6.

difficult mid-forceps delivery; and safety for the baby is considerably greater. Irving, in reporting on cesarean section in a ten-year period at Boston Lying-In Hospital, observed that mid-forceps delivery was as dangerous for the mother as cesarean section and eight times as dangerous for the infant. D'Esopo in 1950 reported from Sloane Hospital for Women, New York, that for the previous nine years it had been no more hazardous to the mother to deliver by cesarean section than by vaginal operation, low forceps excluded. With regard to the infant, D'Esopo observed that, with the increased employment of abdominal delivery and the resulting decrease in the incidence of mid-forceps delivery, there was a correlated decrease in the incidence of fetal birth trauma.

As to what constitutes a trial of labor, it is difficult to postulate any hard and fast rule. While the advent of effective antibacterial therapy has extended the time limits after onset of labor or after rupture of the membranes during which cesarean section may be performed with relative safety to the patient, such measures should not be counted upon to counteract the ill effects of poor clinical judgment. It is the authors' policy to try to evaluate, as early in labor as possible, not only the *possibility* of delivery by the vaginal route, but the *probability* that vaginal delivery can be accomplished with relatively little trauma to mother or infant. With rare exceptions the decision as to whether cesarean section is necessary can be made within 12 hours after the beginning of labor. Manahan and Eastman, in a study of 49 cases of pelvic contracture in which cesarean section was done after 30 hours of labor, reported that the cervix was completely dilated in only eight cases; in 29 cases dilation was less than 5 cm., and in 13 cases less than 3 cm. even after 30 hours of labor. These investigators noted that in cases in which vaginal delivery ultimately was accomplished, dilation of the cervix usually was complete or nearly complete within 12 hours of the onset of labor. It was further observed that in the presence of pelvic contracture if trial labor was extended beyond 30 hours, fetal mortality was more than 30 per cent.

Previous Cesarean Section

In the belief that repeat cesarean section is preferable to the risk of uterine rupture during labor, the authors carry out cesarean section delivery after approximately 39 weeks of pregnancy in any case in which there has been previous delivery by cesarean section.

Placenta Previa and Premature Separation of Placenta

These conditions cause a high maternal and infant mortality rate. Actual loss of blood and resulting shock cause many maternal deaths. The associated anoxia is a major factor in the fetal loss in these conditions. Also, prematurity of the baby contributes to the high rate. Delay in treatment must often be blamed for the aggravation of symptoms which may eventually lead to a condition from which the patient cannot be rescued.

While a general rule cannot be applied, it seems justifiable to state that in the presence of either of these conditions delivery should be carried out as expeditiously as is practicable, in the hope of preventing loss of blood and resulting shock in the mother and of giving to the baby the best possible chance of survival. In applying such a rule, vaginal delivery may be done advantageously only if the findings on examination show conditions favorable for easy and prompt termination, but cesarean section will frequently be the method of choice and, in the authors' opinion, will often give better results for both mother and baby.

Toxemia

In general, if a primipara with a firm uneffaced cervix is not responding to or controlled by medical regimen, the authors carry out cesarean section at the time judged most advantageous to the fetus and the mother.

TYPES OF OPERATION

In the series here reviewed, the low transverse cervical section was the type of operation employed in 1,206 (95 per cent) of the 1,265 (Table 2) cases. To the low cervical section the authors ascribe the following advantages over the classical section: (1) Lower incidence of uterine rupture in a subsequent pregnancy; (2) fewer postoperative complications; (3) less blood loss; (4) greater safety if infection should develop. In the occasional case in which utmost speed of delivery is necessary in the interest of either the mother or the baby, the classical cesarean section probably is the operation of choice.

TABLE 2.—*Types of Operation*

	No. of Cases
Low cervical cesarean	1,206
Cesarean hysterectomy	36
Classical cesarean	14
Extraperitoneal cesarean	9
Total	1,265

ANESTHESIA

In the six-year period covered in this study there was a shift away from anesthesia by inhalation (chiefly ether) and toward low spinal injection (Table 3). There were no maternal deaths due to the anesthetic agents, and in no case could fetal death be directly attributed to the spinal anesthetic agent. Every effort should be made to obtain the services of capable anesthetists in order to obtain the best results.

TABLE 3.—*Anesthesia for Cesarean Section*

Type	1943-44	1945-46	1947-48	Total
Spinal	20	111	441	572
Gas, oxygen, ether	217	233	34	484
Other inhalation	61	46	10	117
Local	15	13	12	40
Sodium pentothal	2	18	15	35
Caudal	0	4	13	17
				1,265

MORBIDITY

In considering postpartum morbidity, any patient with a temperature of 100.4° F. or more in any two 24-hour periods exclusive of the first 24 hours was classified as being in a morbid state. The incidence of morbidity in relation to the type of anesthesia and the type of operation is shown in Tables 4 and 5. It is noteworthy that the morbidity rate in the group given spinal anesthesia was 15.8 per cent—less than half that in the group anesthetized by inhalation. The incidence of morbidity was about the same with one type of cesarean section as with another. As a general rule, antibiotics were not given prophylactically.

TABLE 4.—*Maternal Morbidity in Relation to Type of Anesthesia*

	No. Patients	Morbidity (Per Cent)
Spinal	572	15.8
Gas, oxygen, ether	484	33.1
All other	209	35.9

TABLE 5.—*Maternal Morbidity in Relation to Type of Operation*

	No. Patients	Morbidity (Per Cent)
Low cervical section	1,206	25.7
Cesarean hysterectomy	36	22.2
Classical cesarean	14	21.4
Extraperitoneal cesarean	9	22.2

MATERNAL DEATHS

In the series of 1,265 cesarean deliveries there were five (0.39 per cent) maternal deaths (Table 6). However, in only one case (0.08 per cent) was death attributable directly to the operation. There were no deaths from hemorrhage or infection. In the 11,888 vaginal deliveries during the same period there were ten maternal deaths, but only three (0.025 per cent) were obstetrical.*

The fetal death rate (Table 7) in the cesarean section series compared favorably with the death rate in the vaginal delivery group. It also compared favorably with results reported from other large obstetrical centers (Table 8). Prematurity and atelectasis were the major causes of fetal death in the series of cesarean sections here reviewed. Practically all fetal deaths were attributable to the factor necessitating cesarean section, and not to the operation itself.

In general, the figures in Table 8 seem to imply that judicious use of cesarean section in a relatively larger per cent of cases lowers both maternal and fetal mortality rates.

D'Esopo,[1] in a recent evaluation of cesarean section, predicted that the "difficult, traumatic midforceps operations will be relegated to the obsolete procedures along with craniotomy, high forceps, versions, the bags, and bougies. The obstetrician will gradually reduce the incidence of vaginal operative deliveries by accepting a less rigid definition of cephalopelvic disproportion, by simply substituting the cesarean section for difficult vaginal deliveries when the occasion for such deliveries unpredictably

*The causes of death in the other seven cases were: transfusion reaction, miliary tuberculosis at three months, bulbar poliomyelitis, Landry's paralysis at three months, chronic pyelonephritis at six months, intestinal obstruction (volvulus) at three months, and spontaneous subarachnoid hemorrhage at seven months.

TABLE 6.—*Cases in Which Maternal Deaths Followed Cesarean Section*

Case	Age	Parity	History	Labor	Died	Cause of Death
1.	31 yr.	4	Essential hypertension Repeat preeclampsia	0	15 min.	Eclampsia Intracranial hemorrhage
2.	26 yr.	0	Moderate preeclampsia	0	3 hr.	Eclampsia Intracranial hemorrhage
3.	26 yr.	0	Moderate preeclampsia	0	48 hr.	Eclampsia Intracranial hemorrhage
4.	23 yr.	0	Not pertinent	0	30 hr.	Rupture of aneurysm, anterior communicating circle of Willis
5.	38 yr.	0	Not pertinent	10 hr.	28 days	Pulmonary embolism

Living baby in each case

TABLE 7.—*Fetal Mortality Rates Associated with Vaginal and Cesarean Section in a Series of 13,153 Deliveries*

	Vaginal		Cesarean	
	No.	Per Cent	No.	Per Cent
Deliveries	11,888		1,265	
Stillbirths	163	1.4	19	1.5
Neonatal deaths	216	1.8	29	2.3
Total fetal deaths	379	3.2	48	3.8

arises. Perhaps the best data to substantiate the value of such a policy is noted in the fact that cranial injuries at birth, as revealed by autopsy files at Sloane Hospital, New York, have been reduced to very nearly one per thousand births. The factors which make cesarean section so safe today make normal vaginal delivery even safer. Greater safety, especially to the mother, will always be inherent in the normal delivery, and for that reason we will never reach a stage in the development of the specialty when the cesarean rate may be permitted to rise with impunity." The authors agree with D'Esopo.

924 East Main Street.

TABLE 8.—*Cesarean Statistics Taken from Various Reports*

	Cesarean Sections	Cesarean Per Cent of Total Deliveries	Mortality Per Cent Cesarean Section	
			Maternal	Fetal
Dublin, Ireland (Collected) 1932-46	2,273	2.1	2.7	11.4
Evanston Hosp., Ill., 20,811 deliveries to 1948	856	4.1	0.93	8.2
Rochester, N. Y., (Collected) 1937-46	1,619	2.4	0.94	7.9
Boston Lying-In Clinic, 1934-43	1,094	3.2	1.4	7.8
Boston Lying-In (Private) 1934-43	793	6.7	1.1	5.5
Sloane Hospital, N. Y., 1941-48	1,000	5.8	0.1	3.7
Children'sHospital, San Francisco, 1943-48	1,265	9.6	0.39	3.8

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Discussion by DONALD W. DECARLE, M.D., *San Francisco*

It was Dr. J. C. Litzenberg who defined the conservative obstetrician as "the one who knows when to be radical." I hope I am not presumptuous in applying this qualifying definition to those of us whose results have been so well presented by Dr. Nanninga. I think there is little question that in the majority of private hospitals and even in many of the teaching institutions there has been a steady and justifiable increase in the percentage of abdominal cesarean sections during the past two decades. In my opinion, this increase has been the result of several factors. The majority of these have already been presented and discussed by the authors. Some I would like to further emphasize and others I would like to modify.

In the first place, there has been a gradual broadening of the indications for abdominal cesarean section. No one can deny that there has been a definite improvement in both fetal and maternal mortality in the presence of hemorrhage during the third trimester. Increased safety in transfusion technique, admittedly has been the chief factor. However, the swing toward abdominal delivery, especially in the presence of proven placenta previa, has also been a definite contribution. Secondly, there has been an increasing tendency toward surgical interference to salvage babies showing signs of intrauterine embarrassment, with justifying results. Thus, fetal distress is now considered by many to be a definite indication for cesarean section.

Next, the authors have shown the improved results in the presence of potential infection, making trial labor a safe procedure. The improvement may correctly be attributed to antibiotics, and to the improved technique of cesarean section, especially the low cervical and the extraperitoneal types of procedure.

Lastly, I am in entire agreement with the authors in their views on mid-forceps procedures, with one exception. It is common knowledge that the number of mid-forceps maneuvers increases in proportion to the number of cases in which caudal anesthesia is employed. However, with the increased relaxation obtained by this form of anesthesia, mid-forceps procedures are not the hazard that they were, and still are, in cases in which the patient is under general anesthesia.

By way of modification rather than criticism, I would like to further clarify our attitude in the handling of the elderly primipara. The age alone should never be considered the criterion for abdominal delivery. However, in general, if one or more indications, whether definite or questionable, are found in a primipara 35 years of age or over, it is our feeling that abdominal cesarean section is entirely justifiable.

I wish to say a word in favor of low spinal anesthesia in cesarean section. It is a procedure which has been severely condemned in the past as definitely dangerous to both mother and infant. In our experience during the past four years, this procedure has been employed almost exclusively. With the Pfannesteil type of abdominal incision which we use for cesarean section, one half the anesthetic agent previously employed is sufficient. Skin anesthesia midway to or at the umbilicus is all that is necessary for complete pain relief, thus considerably increasing the margin of safety for the mother.

Preliminary Studies of the Gastrointestinal Tract with Colloidal Barium

FRANK WINDHOLZ, M.D., HENRY S. KAPLAN, M.D., and HENRY H. JONES, M.D., *San Francisco*

SUMMARY

A stable colloidal suspension of barium sulfate has been developed and tested in roentgen examination of the gastrointestinal tract. The new material is rather distinctive in radiographic appearance and can usually be differentiated from simple barium-water mixtures by inspection of roentgenograms of the opacified stomach and small intestine. It usually affords a satisfactory demonstration of the mucosal folds of the stomach and duodenal bulb and is considerably more resistant to flocculation and precipitation by retained gastric secretions. In the small intestine, it has little tendency to undergo flocculation and fragmentation, and permits visualization of fine mucosal configurations with unusual clarity. Its motility is about the same as that of conventional suspensions. Air contrast colon examinations with the colloidal preparation exhibit a very uniform, opaque, and stable coating of the bowel wall and are more consistently satisfactory than when simple barium-water mixtures are used.

FOR many years radiologists have been seeking an opaque medium with which consistently better visualization of the gastrointestinal tract might be obtained than with the usual suspension of barium sulfate in water. Such suspensions are labile under a variety of conditions; flocculation and precipitation of the barium may occur suddenly as a result of dilution, dehydration, or change in pH. These shortcomings are especially noticeable during examination of the small intestine, air contrast examination of the colon, and attempted demonstration of gastric mucosal folds.

The ideal medium would provide a uniform, smooth, radiopaque coating over the bowel wall; would mix readily with retained secretions of the stomach, intestine, and colon; would not be influenced by variation in pH, by contact with mucous secretion, or by the action of the digestive enzymes; would pass freely and promptly through the bowel with no tendency to break up into isolated collections, to precipitate out of suspension, or to become inspissated and impacted. In addition, the medium must of course be non-toxic, palatable, convenient to use, and inexpensive.

From the Department of Radiology, Stanford University Hospitals.

Presented before the Section on Radiology at the 79th Annual Session of the California Medical Association, San Diego, April 30-May 3, 1950.

Dr. Windholz died April 29, 1950.

DESCRIPTION OF THE COLLOIDAL MEDIUM

In 1949 one of the authors (Windholz) was instrumental in the development of a stable colloidal aqueous suspension of barium sulfate. This preparation is now available in two forms: a viscous concentrated suspension, for examination of the upper gastrointestinal tract, and a less viscous, dilute suspension for use in opaque enemas.*

The medium for use in the upper gastrointestinal tract is about the consistency of heavy cream. It remains in suspension indefinitely, requiring only slight shaking before use if it has been standing more than a few days. It resists precipitation by saliva and gastrointestinal secretions (it will precipitate slightly when mixed with retained gastric secretions but is much less subject to this fault than the usual barium sulfate and water mixtures). It forms a readily visible (although thin), uniform, unbroken coating over the stomach or bowel wall which gives an unusually good silhouette of the mucosal surface, especially when air is present to provide a double contrast. In addition, it tends to remain in a single column which in many cases may extend from stomach to colon. Segmentation and flocculation are minimal. The material resists desiccation and remains fluid in its passage through the alimentary tract. Constipation has not been a source of complaint. The material has no food value and is tasteless; however, vanilla or other flavoring is usually added by the manufacturer to make it more palatable. The medium for colonic use is similar but more fluid and considerably less dense.

PROCEDURE AND RESULTS

Clinical evaluation of the new medium was carried out in the Department of Radiology, Stanford University Hospitals. Two rooms were provided with identical radiographic-fluoroscopic equipment. The colloidal material was used in one of these rooms and the usual barium sulfate and water mixture in the other. The two rooms did not receive an exactly equal number of patients, but no attempt was made to select patients for examination with one medium or the other.

After the medium had been in use about four months, two of the authors (Kaplan and Jones) re-

*Made by the Pacific Chemical Company, 617 Montgomery Street, San Francisco, under the trade name "Baridol."

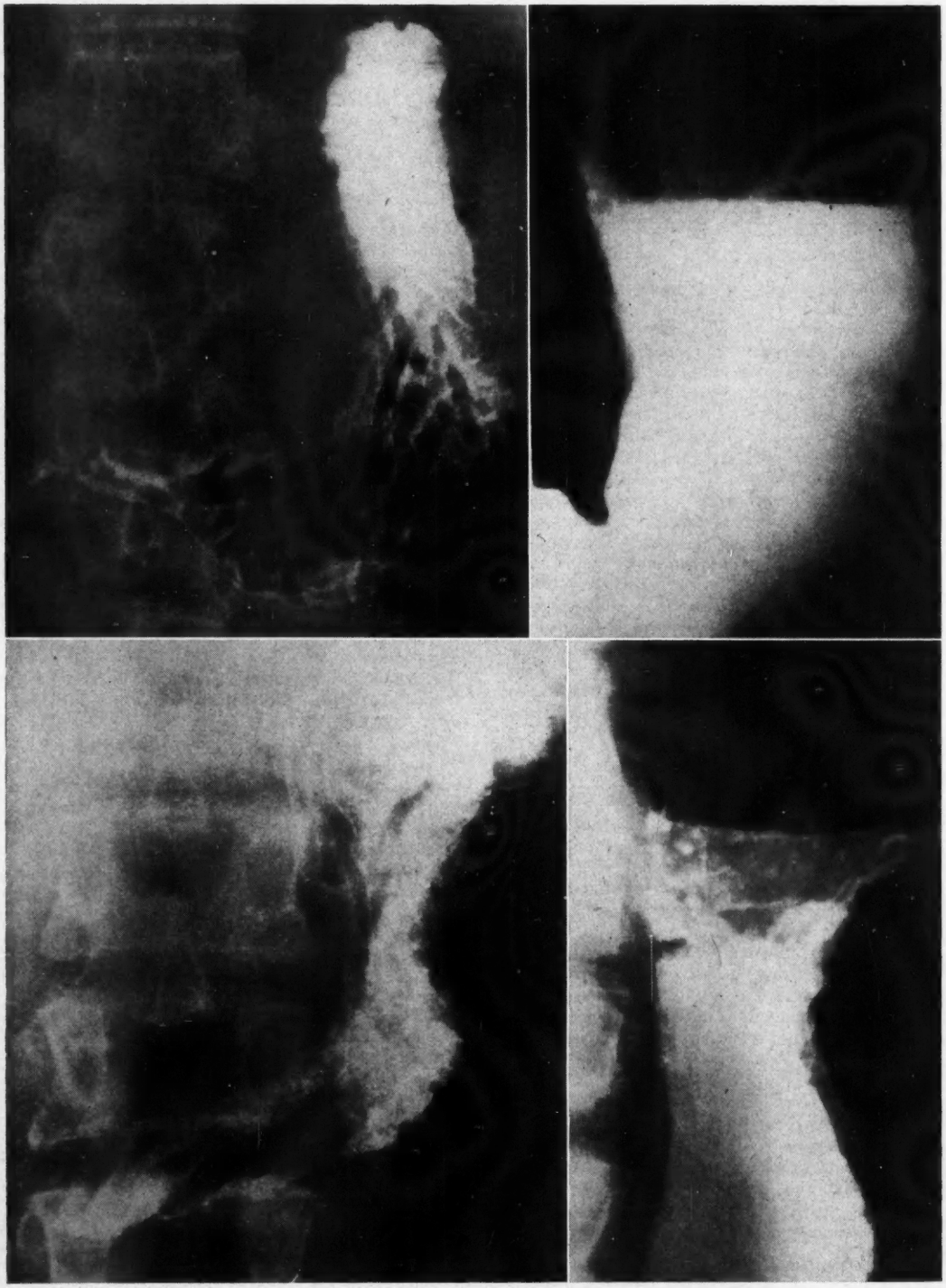

Figure 1.—*Upper left:* Good spot film demonstration of gastric mucosal pattern with colloidal barium despite *(upper right)* retained fluid in stomach seen layered above barium on erect spot films. *Lower left:* Prompt precipitation of conventional barium-water suspension in amorphous flocculated form, obscuring mucosal pattern, in the presence of *(lower right)* retained gastric secretions.

viewed the films in a series of 208 cases with reference to the following items: (1) recognition of type of medium employed; (2) demonstration of the gastric mucosal pattern, filled stomach, filled and compressed duodenal bulb, mucosal pattern of small bowel, distribution and contours of small bowel, and degree of flocculation; and (3) motility of the meal. In the series, the colloidal preparation was used in 137 cases while 71 control cases received the usual barium sulfate suspension in water.

The recognition test was carried out because it was felt that if the new medium were significantly different from conventional barium-water mixtures it should be possible to detect which had been used in a given examination merely by inspection of the films. The results of this test are summarized in Table 1. It can be seen that the colloidal material was seldom mistaken for conventional barium suspensions, but that the converse occurred not infrequently. Review of the latter group revealed that confusion of the two media was almost entirely confined to the group of cases in which ordinary barium-water mixtures had given relatively optimal results.

Qualitative evaluation of each case was made at the time of the recognition test, before the medium actually used in that case was revealed. Some of the collected observations are presented in Table 2. Both media gave satisfactory opacification of the filled stomach. Gastric mucosal folds were well demonstrated in a greater percentage of cases when the colloidal material was used, although visualiza-

TABLE 1.—*Colloidal Barium Recognition Test*
(208 Examinations of Upper Gastrointestinal Tract)

In *71* cases *barium in water* was used. In review of the films:	
50%	were recognized as *barium in water* in the stomach.
60%	were recognized as *barium in water* in the small intestine.
35%	were mistaken for *colloidal barium* in the stomach.
25%	were mistaken for *colloidal barium* in the small intestine.
15%	were indeterminate or incomplete.
In *137* cases *colloidal barium* was used. In review of the films:	
90%	were recognized as *colloidal barium.*
5%	were mistaken for *barium in water.*
5%	were indeterminate or incomplete.

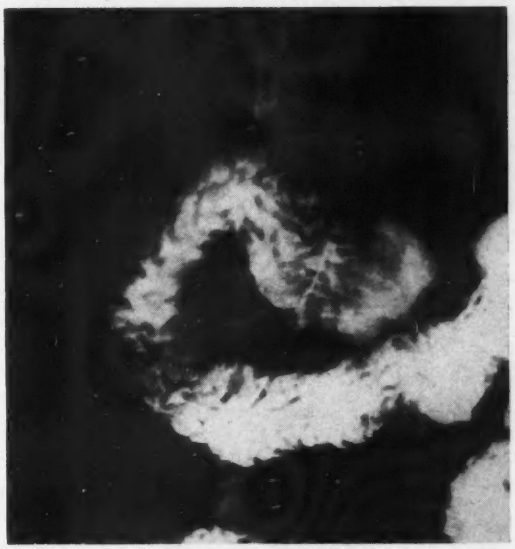

Figure 3.—Partially "pressed out" normal duodenal bulb showing longitudinal mucosal folds as revealed by colloidal barium.

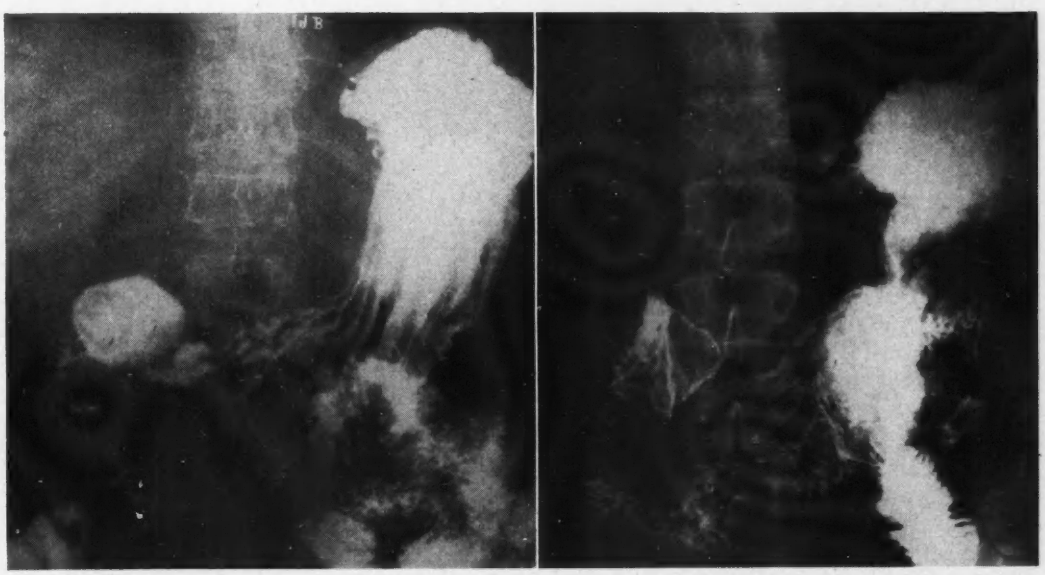

Figure 2.—Double contrast visualization of antral portion of stomach coated with colloidal barium in supine projection. In the film at the right, the duodenal bulb is similarly demonstrated.

TABLE 2.—*Mucosal Pattern Evaluation*

	Good	*Fair*	*Poor*
STOMACH:			
Barium in water	60%	25%	15%
Colloidal barium	70%	20%	10%
DUODENAL BULB*:			
Barium in water	50%	30%	5%
Colloidal barium	80%	5%	5%
SMALL INTESTINE:			
Plain barium	50%	40%	10%
Colloidal barium	90%	8%	2%

*Evaluated on pressure spot films. Bulb not visualized in remaining cases.

tion was unsatisfactory in 10 per cent of the cases even with this medium. The new material often yielded good mucosal patterns in the presence of retained gastric secretion (Figure 1). It tended to coat the gastric surface rather uniformly, and, in the presence of air, this property often afforded unusual demonstrations of the antrum and corpus in supine projections (Figure 2).

The relative merits of the two media in the duodenal bulb paralleled those in the stomach. The greater film-forming properties of the colloidal material were even more evident, a faint coating being rather consistently observable on compression "spot" films (Figure 3).

In the small intestine, the colloidal suspension provided a pattern quite unlike that usually observed with barium and water mixtures. It formed a smooth uniform coating which outlined the walls and valvulae with great clarity (Figure 4). The tendency to maintain a single column was pronounced, and frequently the entire small bowel from stomach to colon was clearly visualized on a single film (Figure 5). Flocculation and segmentation were minimal (Table 3). Motility did not appear to be significantly different from that of ordinary barium-water mixtures.

The new medium has not been used extensively for opaque enema examination of the colon because its advantageous properties are minimized under these conditions and its greater viscosity delays filling of the colon. It has, however, yielded consistently superior results in double contrast examinations of the large bowel. The technique of this examination is described elsewhere[1] and only those details pertinent to the use of the new medium will be noted here.

The double contrast examination was always done as a separate procedure, not as an immediate sequel to the conventional examination with opaque enema. The "colonic" preparation used initially was felt to be insufficiently opaque and more recently the more

TABLE 3.—*Observations in Small Intestine*

	None	*Slight*	*Moderate to Pronounced*	
FLOCCULATION:				
Barium in water	50%	20%	30%	
Colloidal barium	90%	5%	3% †	
	Single Column	*Slight*	*Moderate*	*Marked*
FRAGMENTATION:				
Barium in water	35%	20%	40%	5%
Colloidal barium	85%	6%	8%	1%
	One Hour	*Two Hours*	*Five Hours*	
MOTILITY*:				
Barium in water	45%	65%	85%	
Colloidal barium	35%	60%	85%	

*Head of meal in cecum or colon at indicated interval.
†In 2 per cent of cases, flocculation was indeterminate.

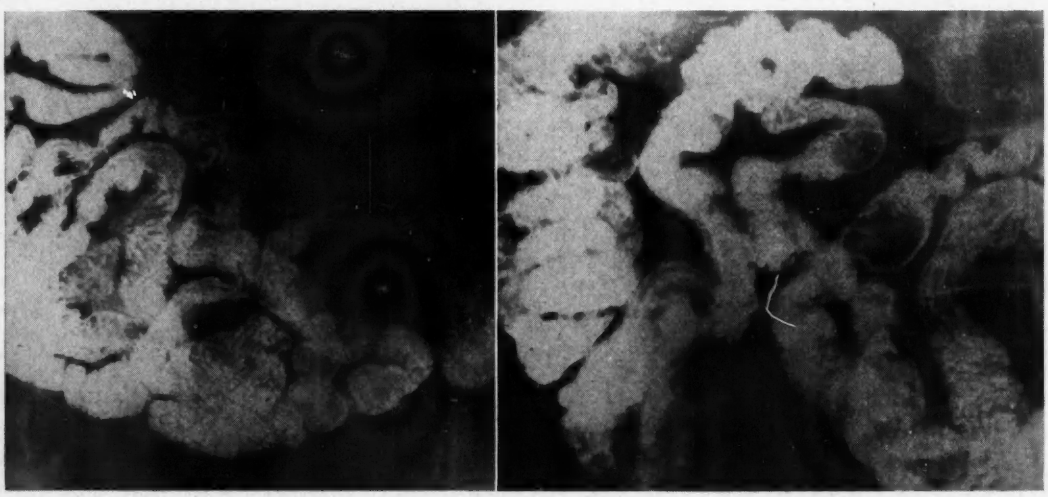

Figure 4.—Demonstration of intimate details of small intestinal mucosal surface with colloidal barium. Note ileocecal valve region in film at the right.

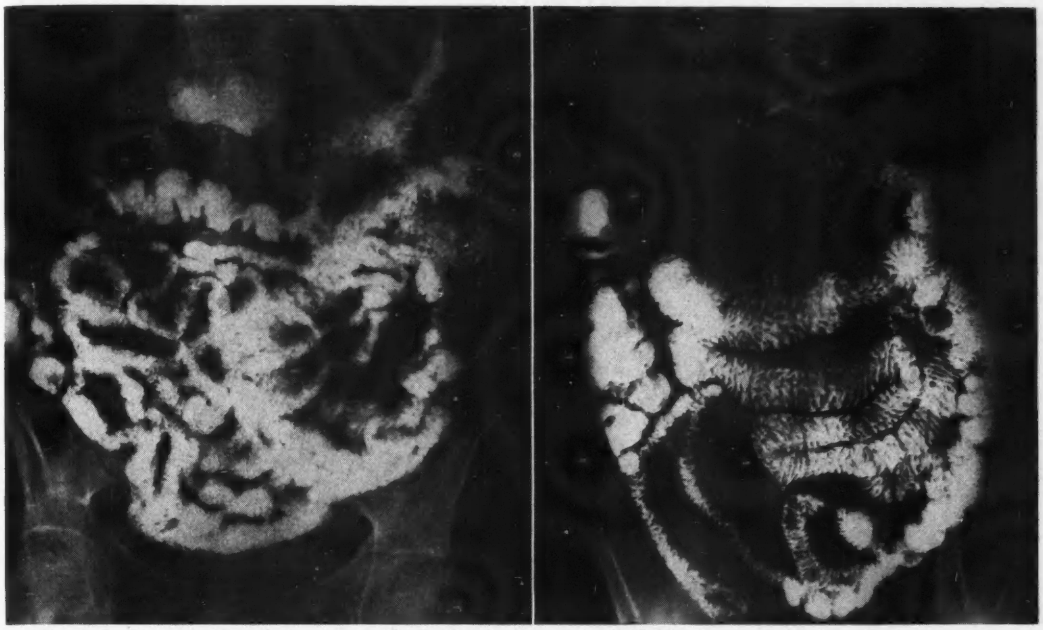

Figure 5.—Progress films in two cases, illustrating tendency of colloidal barium to maintain a single opaque column from the stomach or upper small intestine into the colon.

Figure 6.—Spot film showing uniform opaque coating obtained with colloidal barium in air contrast colon examination.

viscous preparation usually employed in gastric examinations has been used. This material will not fill the colon by gravity flow; it may be "milked" along the enema tube or injected with a large piston-type syringe. Air is then pumped into the colon with the conventional rubber bulb and bag and the patient is so manipulated as to facilitate the distribution of the opaque medium. The inflated, barium-coated bowel is easily visualized fluoroscopically when the viscous medium is used, and spot films may be made selectively over any desired segment.

With proper technique, the colloidal medium provides a thin, uniform, smooth coating of homogeneous character (Figure 6). A number of polyps measuring less than 1 cm. in diameter have thus been detected and verified. Satisfactory examinations have resulted from the use of the new medium in this procedure much more consistently than with simple barium-water mixtures. However, it cannot yet be stated that the colloidal material will enable the detection of a significantly greater proportion of polyps than has hitherto been possible.

DISCUSSION

Completely objective evaluation of a radiographic opaque medium is not really possible. Nevertheless, it is felt that the "blind" method of analysis of parallel test and control cases has eliminated many major sources of subjective error in this study. The evidence indicates that the colloidal medium is superior to simple barium-water mixtures in demonstrating the mucosal surface of the small intestine and duodenal bulb, in coating the colon during air contrast examinations, and in its resistance to precipitation by gastric secretions. These results are preliminary, and much more experience with this medium will be necessary before a definitive evaluation can be attempted. Nevertheless, they encourage the hope that further investigation will soon yield an optimal opaque medium for gastrointestinal examination.

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The Treatment of Mediastinal Tumors

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SUMMARY

Because there can be no certainty of diagnosis without it, thoracotomy is indicated in cases in which there is roentgenographic evidence of mediastinal tumor. "Watchful waiting" is considered unwise because the tumor may be malignant when first observed or may later undergo malignant change. Even if the lesion is and remains benign, an increase in the size of the mass may cause obstructive pressures necessitating operation ultimately. Moreover, infection and inflammation may develop at the site during prolonged observation, making operation more difficult.

The hazards of thoracotomy, which have been greatly reduced in the last few years, are less than the hazards of waiting.

IT is unfortunate that many physicians, in dealing with cases in which an abnormal mediastinal shadow is observed on x-ray films, still adhere to the "wait and see" school or consider *all* patients in such circumstances as candidates for a trial of roentgen therapy. Time was, not many years ago, when such an attitude could be considered warranted because the hazards of exploratory thoracotomy were considerable and it was particularly difficult to justify the operation if the suspected tumor was causing no clinical symptoms. Exploration was done only if there were moderately severe symptoms; and the over-all results, statistically speaking, were not impressive.

Now, however, with the risks of thoracotomy greatly reduced and with improvement in the use of various other diagnostic aids, it is to be hoped that physicians in general practice, who so often are the first to observe a patient, will immediately recommend further advice as to diagnosis and treatment in any case in which there is roentgen evidence of mediastinal tumor.

With the increasing number of mass roentgen surveys which are being carried out, it is probable that more and more persons with asymptomatic mediastinal shadows will seek medical advice. Not infrequently, patients are reluctant to submit to operation, particularly if there are no distressing symptoms present. In such circumstances there is a brief explanation which frequently is of aid. After the shadow is pointed out, the patient is asked what he or she would consider necessary if a lump of similar size, which could be felt, suddenly appeared in the breast, abdomen, pelvis or under the skin.

The diagnosis of mediastinal tumors as to histologic type is infinitely more difficult than the mere recognition of a mediastinal shadow on roentgen examination. Considering the embryology of the region, the presence of descendants of all three germinal layers and the complicated adult structures contained therein, it is small wonder that exact labeling usually is impossible. Even with the tumor extirpated and examined, pathologists frequently disagree among themselves as to the exact cell type and also as to benignancy or malignancy.

It is common practice to divide the mediastinum into anterior, middle, and posterior compartments. One can then speak in general, of the most common varieties of tumor occurring anteriorly, posteriorly, superiorly, inferiorly, unilaterally or bilaterally. Thus, statistically, one has a better chance of guessing the diagnosis preoperatively. This is not of great value, however, to the individual patient. The most frequent anterior mediastinal tumors are teratoid tumors and thymomas. In the middle mediastinum, the lymphoma group (including Hodgkin's disease) is of most common occurrence. The most frequently encountered posterior tumors are neurogenic. Cysts of various types (bronchiogenic, "spring water," enterogenous, etc.), lipomas and other uncommon tumors, and granulomas may occur anywhere. The authors have observed in the right superior mediastinum, for instance, lymphoma, thymoma, thyroid adenoma, neurofibroma, bronchiogenic cyst, pericardial cyst, granuloma, lipoma, meningocele and aneurysm.

DIAGNOSTIC AIDS

Roentgen examination remains the most reliable single method in the diagnosis of a mediastinal shadow. Films in the frontal and lateral projections are mandatory. Fluoroscopy also is necessary in determining the pathologic dynamics of the neoplasm including pulsation and the presence of concomitant nerve palsies. Special roentgen examinations include visualization of the esophagus by barium, rib detail studies for calcification or bone erosion, tomograms and kymograms. In reference to the latter, it must be remembered that many aneurysms do not pulsate and many cystic tumors do pulsate (Figures 1 and 2). In specific regard to aneurysms, angiocardiography may be of considerable aid.[1] If this lesion is suspected, a Wassermann test of the blood should be done and the patient should be carefully questioned with regard to trauma.

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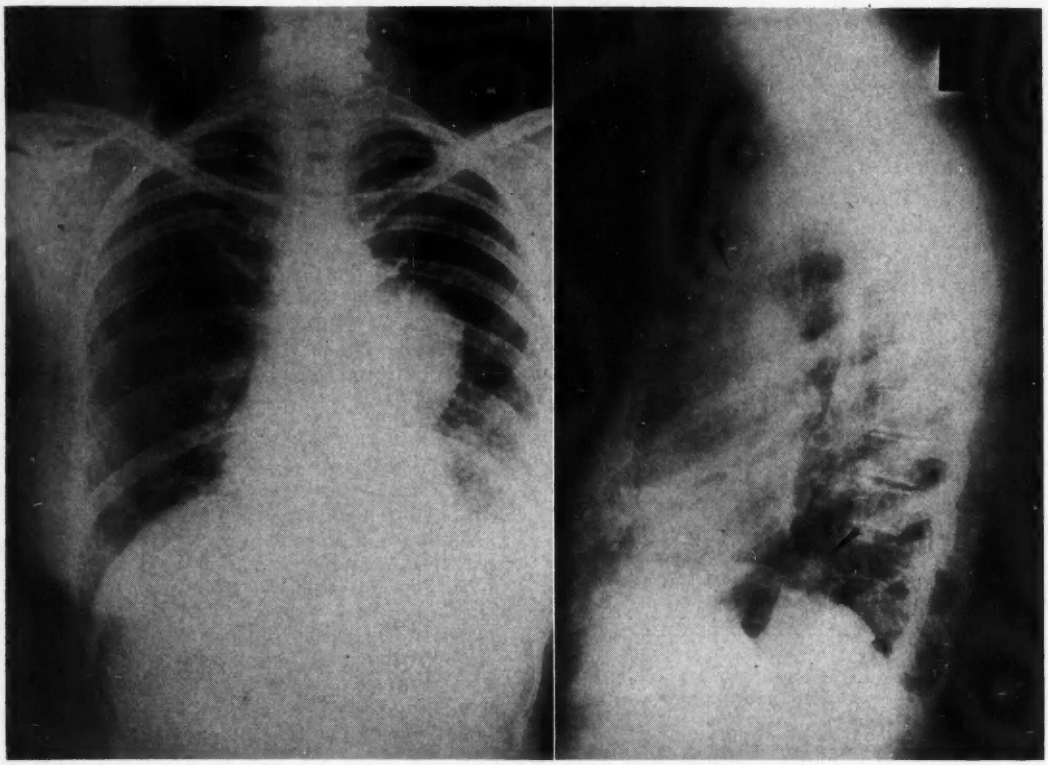

Figure 1.—Roentgenogram in frontal and left lateral views. There is an anterior mediastinal mass which showed expansile arterial pulsation both fluoroscopically and by kymogram. It had been observed for six years and there had been some increase in size. It had been considered an aneurysm during that time. At operation, a multilocular teratoid cyst was removed. The supradiaphragmatic shadow seen in the lateral projection was a small traumatic diaphragmatic hernia containing omentum.

A typical lymphoma is frequently bilateral and tends to have a scalloped border rather than perfectly rounded edges. Only if a lymphoma is suspected should roentgen therapy—that is, "roentgen biopsy"—be considered.[15]

Bronchoscopy may be performed if there are symptoms of major bronchial obstruction, such as cough, sputum, and hemoptysis; and bronchograms may be indicated under the same conditions. Direct and indirect laryngoscopy are advisable if there is suspicion of recurrent nerve paresis. Biopsy of supraclavicular lymph nodes from the fat pad overlying the anterior scalene muscle may be very helpful.[6] This is more likely to be productive of information if the specimen is taken from the right side rather than from the left.

Pneumothorax and thoracoscopy occasionally have been advised. The authors believe these studies are without merit in most instances. There is a certain amount of time consumed, and the procedure is not without cost nor entirely without risk. Thoracoscopy and biopsy can at best supply only the diagnosis, and it is but infrequently that this will change one's mind concerning the desirability of exploratory operation.

In certain rounded lesions near the spine with extensive erosion, meningocele must be considered and intraspinal Pantopaque studies will be of value.[5]

Figure 2.—Photograph of oval multilocular teratoid cyst. The fluid was a tenacious brown, grumous material. Microscopically, there were observed gastrointestinal glands, bronchial mucosa, squamous epithelium, sebacious glands and hair follicles.

Neurofibromas likewise may cause enlargement of intervertebral foramina with intraspinal "dumbbell" extensions. Mild symptoms of spinal pressure may be present. Even if no such symptoms are present it may be necessary to explore the spinal canal either through the chest or at separate laminectomy.

For lesions at or near the diaphragm, special studies with barium enema, barium meal and pneumoperitoneum may aid in establishing the presence of diaphragmatic hernia[13] of some type.

In general, the authors are opposed to needle biopsy if the preponderance of evidence indicates tumor, for there is always the danger of rupture of a cyst, contamination, or the spread of an early malignant growth. Needle aspiration is valuable in determining the presence of suspected pleural fluid collections.

Studies such as those outlined may give leads as to diagnosis, but they should be chosen with care. Should a majority of them be employed, the cost to the patient might well equal or exceed that of thoracotomy. Nearly all diagnoses must be made at exploration. Justification for many of the tests becomes evident in the case of the rare patient whose general condition militates against elective surgery. An attempt should be made, therefore, to approximate the diagnosis as nearly as possible, and decision then should be reached on the basis of "calculated risk" whether to continue observation of a possibly benign tumor or to operate for removal of a probably or potentially malignant one.

SIGNS AND SYMPTOMS

In many cases mediastinal tumors cause no symptoms whatsoever. In others, the symptoms are so mild that only by careful questioning can a correlated story be elicited. Signs and symptoms, when present, are protean and depend upon the location, the size, the presence of infection and/or malignant degeneration in the tumor.[4] For the most part, the symptoms are due to pressure on contiguous structures or, in the case of malignant tumor, to infiltration. Thus, pressure on trachea or bronchi will produce cough or wheezing. If a fistula is present, the cough may be productive or there may be blood streaking. Pressure on the esophagus may produce dysphagia. Pressure on nerves may lead to pain, Horner's syndrome, and vocal cord or diaphragmatic paresis. Pressure on vessels may produce obstructive symptoms. Pressure on the heart may be made manifest by transient irregularities or by bizarre electrocardiographic tracings. The size of the growth alone may diminish the pulmonary reserve so much as to produce dyspnea (Figure 3). It will be noted that some of the signs and symptoms mentioned, particularly obstructive symptoms in the blood vessels, Horner's syndrome or other nerve pareses, are commonly associated with malignant infiltration. It must be emphasized that these signs

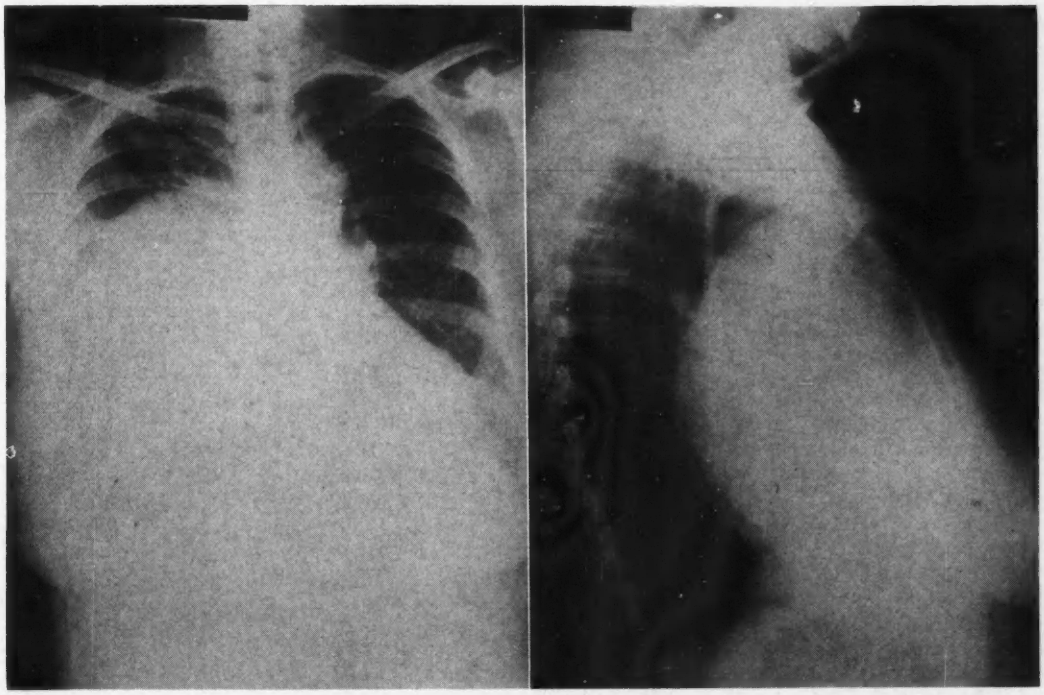

Figure 3.—Frontal and right lateral roentgenograms of a 60-year-old housewife who had been treated for heart trouble for at least ten years without roentgenographic study. She had complained of increasing dyspnea on exertion, orthopnea, and pressure in the right side of the chest. At operation, a huge dermoid cyst was removed which completely filled the right anterior thoracic cavity and extended past the midline superiorly over the first portion of the aortic arch.

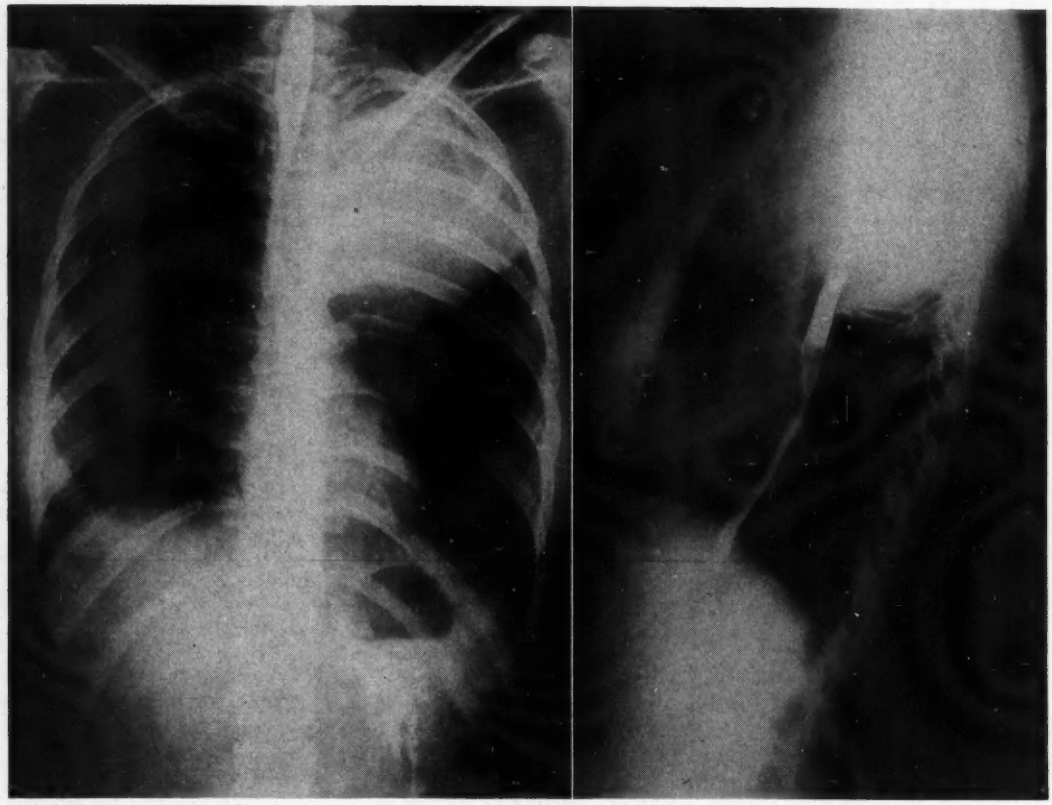

Figure 4.—Frontal and lateral roentgenograms of a 25-year-old housewife who presented the following signs and symptoms: Left Horner's syndrome, paresis of left vocal cord, dilated veins over left shoulder and breast, cough, mild dysphagia.

are not prima facie evidence of malignant disease (Figures 4 and 5). On the other hand, in the tragic circumstance of watchful waiting, symptoms may develop without a great change in the roentgen appearance of the tumor. In such circumstances, malignant degeneration must be strongly suspected.

There is no definite contraindication to operation for removal of mediastinal lymphomas. There are now reports in the literature that in several cases such tumors have been removed as encapsulated masses with no recurrences for considerable periods of time.[3] Suspected aneurysm likewise is no contraindication to exploratory operation, for if aneurysm is encountered it may be supported by cellophane wrapping;[2, 9] in rare instances a traumatic aneurysm may be resected.[14]

JUSTIFICATION FOR OPERATION

Three pitfalls await the physician who counsels inaction or roentgen therapy:

1. An appreciable percentage of mediastinal tumors undergo malignant degeneration or are malignant from the start. In fairly large collected groups of cases, more than 12 per cent of teratoid tumors of the mediastinum were malignant,[10] and neurogenic tumors have been reported malignant in as many as 37 per cent of cases. Except for those of the lymphoma group, roentgen therapy has no effect on

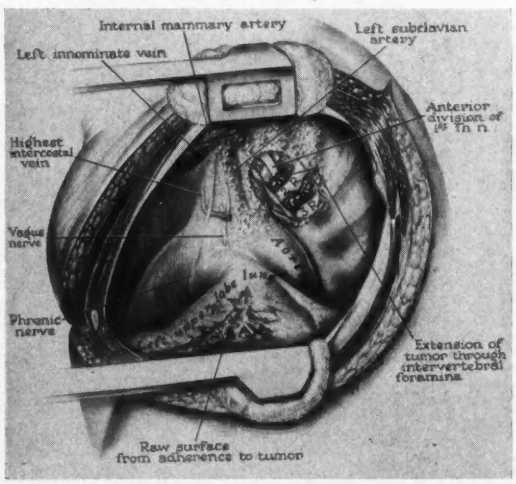

Figure 5.—Drawing at operation. A completely encapsulated and lobulated neurofibroma, 11 cm. in diameter, has been removed by morcellation. As demonstrated, the signs and symptoms were due to pressure and not to malignant infiltration.

malignant mediastinal tumors. Malignant degeneration is accompanied sooner or later by increased symptoms, but by the time such develop, surgical extirpation usually is impossible.

2. Even a tumor which remains benign histologically may become "malignant" as far as the patient is concerned because of compression of vital structures as the growth increases in size.

3. Infection may supervene, particularly in cystic tumors. The development of fistulae, empyema, and extensive fibrosis may make removal difficult if not impossible. The presence of such ineradicable suppuration is obviously life-endangering.

In fine, the risks of thoracotomy are far outweighed by the hazards of waiting. Surgical exploration and removal is the treatment of choice in nearly all cases of mediastinal tumors when they are first discovered and whether they are symptomless or not.

The type of thoracotomy depends considerably on the surgeon's training. In nearly all cases the authors use a transpleural approach by a posterior and lateral incision even if the lesion is anterior. This can be carried out at a level as high as the fourth rib or interspace. In general, the exposure is better than with an anterior approach and ribs can be more readily severed either up or down when necessary. With the posterior approach there is a better chance for accurate approximation of tissues and tight closure of the thoracic wall. Occasionally, a vertical, sternal-splitting incision may be indicated for upper midline tumors. A transverse sternal-splitting approach with deliberate entrance into both pleural cavities may be rarely indicated.

SURGICAL EXPERIENCE

The authors or their associates have now explored the chest in 52 instances of mediastinal lesions. In four cases (7.7 per cent) the lesions were malignant. Two of the 52 patients died as the result of operation. One (meningocele) bled excessively from an anomalous venous plexus during dissection;[5] the other, an infant (neurofibrosarcoma) had acute cardiac arrest at the end of operation and later died of the effects of anoxia. In the latter instance, it was observed at autopsy that the tumor, which was malignant, had begun to invade the thoracic wall.

The types of lesions encountered at operation in 52 cases are shown in Table 1.

In five cases not included in Table 1, exploration revealed diaphragmatic hernia. In two of these cases, herniated liver caused the shadow observed on x-ray films.

The classification of neurogenic tumors is undergoing revision. The authors include neurofibroma (or neurilemmoma), neuroblastoma, ganglioneuroma, and Schwannoma in this classification. Mediastinal cysts probably result from developmental anomalies. In the majority of the cases observed by the authors there were no clinical symptoms. The apparent association between meningocele and Von Rechlinghausen's disease is interesting but unexplained. Harrington[7] has employed the term "teratoid" to include dermoid tumors containing elements of one, two or all three germinal layers. Mediastinal granulomas form an interesting group and have been studied separately.[11] While those reported have been considered tuberculomas, the authors believe this etiologic classification has not been completely substantiated. In the future, careful cultural studies may prove that Coccidioides immitis or Histoplasma capsulatum may be the responsible agent in some cases. Encapsulated thymomas have been removed from four patients; in one case, two separate thymomas were excised. There has been disagreement as to whether these tumors are benign or malignant. In one case ten years have elapsed since surgical removal of a thymoma and the patient remains well. Hyperthyroidism was not a symptom in the four patients from whom thyroid adenomas were removed. In one instance, thoracotomy was necessary to free mediastinal extension of the tumor, which was then removed through the neck with the thyroid gland.

TABLE 1.—*Types of Mediastinal Lesions in 52 Cases in Which Thoracotomy Was Carried Out*

BENIGN LESIONS—48	
1. Neurogenic tumor	14
2. Cyst	9
Bronchiogenic	6
Pericardial	2
Meningocele	1
3. Teratoid tumor (includes dermoid cysts)	8
4. Granuloma	4
5. Thymoma	4
Thyroid adenoma	4
Aneurysm	2
Lipoma	1
Leiomyoma (esophagus)	1
Lymphangioma (hygroma)	1
MALIGNANT LESIONS—4	
Neurofibrosarcoma	2
Intrathoracic, posterior	1
Diaphragmatic	1
Malignant thymoma	1
Squamous cell carcinoma (probably from bronchiogenic cyst)	1

The development of malignant degeneration is of grave significance. Two of the four patients who had malignant tumors are dead and a third (malignant thymoma) who was operated upon only recently had pleural implants at the time of operation. Only the patient who had primary neurofibrosarcoma of the diaphragm is still well—five years following removal of the tumor.[11]

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Antibiotics in Management of Staphylococcal Endocarditis

With Special Reference to Increasing Bacterial Resistance

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SUMMARY

Eighteen patients with staphylococcal endocarditis were observed at the Los Angeles County Hospital over a 3-year period (1947-49, inclusive). Twelve died.

Bacterial sensitivity studies were carried out in 15 of the cases, and there was resistance to penicillin in ten.

Aureomycin was effective in two cases of Staphylococcus aureus endocarditis in which there was no response to penicillin therapy.

In one case of Staphylococcus aureus endocarditis the organism was resistant to penicillin and developed increasing resistance to aureomycin.

THE purpose of this paper is to evaluate the present status of penicillin and other antibiotics in the management of staphylococcal endocarditis. Since the introduction of penicillin, isolated case reports of penicillin cures of staphylococcal endocarditis have appeared in the literature.[3-9,12] During the three-year period 1947-1949, inclusive, 18 patients with staphylococcal endocarditis were observed at the Los Angeles County Hospital. In nine of the cases the etiological organism was Staphylococcus aureus, and in the remaining nine it was Staphylococcus albus. The mortality rate in this series was 66 per cent, despite penicillin therapy. Zeller and associates[13] in 1948 reported 15 cases of staphylococcal endocarditis, of which seven were caused by Staphylococcus aureus and seven by Staphylococcus albus. In the remaining case, both Staphylococcus aureus and albus were found in the blood stream. All of the patients received penicillin, and five (33 per cent) died. In view of the considerably higher mortality rate in the Los Angeles County Hospital series, an attempt was made to correlate bacterial sensitivity in vitro with the response of the patient to treatment with antibiotics in those cases for which the necessary data were available.

For many years, bacterial endocarditis had been classified as being either acute or subacute depending on the duration of illness prior to death. In the "acute" type the duration of the illness was less than six weeks and in the "subacute" type it was greater than six weeks. With the introduction of effective antibiotics it was felt that this distinction should be dropped, and that distinction should be made on the basis of causative organism. In the present series the authors were impressed by the rapid and fulminating course in the six fatal cases of Staphylococcus aureus endocarditis; all the patients were dead within three weeks after the initial onset of illness (Table 1). At postmortem examination, ulcerative vegetative endocarditis was noted in all six patients; and five had, in addition, multiple septic infarcts and abscesses of the myocardium, liver, kidney, spleen, bone, and brain. The sixth patient died of a massive cerebral embolus. In the cases of the six patients who died of Staphylococcus albus endocarditis the illness was much more prolonged, lasting for from three weeks to as long as ten months. This suggests that in the series of cases here reviewed the strains of Staphylococcus aureus were much more virulent than those of Staphylococcus albus. Additional evidence along these lines is the fact that all the Staphylococcus aureus organisms were coagulase-positive, whereas all but one culture of the recovered Staphylococcus albus organisms were coagulase-negative.

Because of the difference in virulence found in this series, the endocarditis due to Staphylococcus aureus and Staphylococcus albus will be discussed separately.

Staphylococcus Aureus Endocarditis

Fatal Cases. Of the nine patients with Staphylococcus aureus endocarditis, six died (Table 2). In Table 2 bacterial sensitivity studies are correlated with the therapeutic response. Sensitivity studies were obtained in only two of the six fatal cases, Cases 4 and 5.

Case 4 typifies therapeutic failure owing to pronounced penicillin and streptomycin resistance. A 36-year-old white woman was admitted to the hospital because of chills and fever of three days' duration. Shortly after admission, blood cultures were reported as positive for Staphylococcus aureus, coagulase-positive. Bacterial sensitivity studies showed no inhibition of bacterial growth by 180 units of penicillin per cubic centimeter of culture, or by 250 micrograms of streptomycin per cubic

TABLE 1.—*Duration of Illness in 12 Fatal Cases of Staphylococcal Endocarditis*

Causative Organism	No. of Cases	Duration of Course (Weeks)
Staphylococcus aureus	3	1
	1	2
	2	3
Staphylococcus albus	1	3
	1	6
	1	8
	2	12
	1	40

From the University of Southern California, School of Medicine, Departments of Cardiology and Microbiology; and the Los Angeles County Hospital.

TABLE 2.—*Bacterial Sensitivity Studies and Therapeutic Response to Antibiotics in Staphylococcus Aureus Endocarditis*

Case No.		Bacterial Sensitivity (Concentration per cc. of culture for in vitro inhibition) Penicillin (Units per cc.)	Streptomycin (Micrograms per cc.)	Aureomycin (Micrograms per cc.)	Therapy and Response
1.		0.2	....	....	Penicillin—cure.
2.		200	....	1	Penicillin—no response. Aureomycin—cure.
3.	a.	....	....	....	a. First admission, 1946. No sensitivity studies. Penicillin—cure.
	b.	180	62	1	b. Second admission, 1948. Penicillin-fast. Aureomycin—cure.
4.		180	250	....	Penicillin—died.
5.	a.	....	....	....	a. First admission, 1947. No sensitivity studies. Penicillin—cure.
	b.	0.1 Increased to 60 in 2 weeks	....	....	b. Final admission, 1948. Penicillin and sulfa drugs—died.
6.		180	8	5; increased to 40 in 10 days	Aureomycin—died.
7.		....	....	....	Penicillin and sulfa drugs, no sensitivity studies—died.
8.		....	....	....	Penicillin—died. No blood cultures. Diagnosis made postmortem.
9.		....	....	....	Penicillin, no sensitivity studies—died 24 hours after admission.
10.		....	....	....	No therapy, no sensitivity studies—died 24 hours after admission.

centimeter of culture. Two million units of penicillin were given daily by continuous intramuscular drip. The febrile course persisted and the patient died after nine days of penicillin therapy. At postmortem examination, ulcerative vegetative mitral valvulitis and minute abscesses in the myocardium, spleen, brain and kidneys were noted.

Case 5 strikingly illustrated the development of increasing resistance to penicillin during therapy. In 1947, at the time of the patient's initial admission, the diagnosis of Staphylococcus aureus endocarditis was made and the response to penicillin was dramatic. In 1948 the patient reentered with either a recurrence or a new infection. At the time the organism was found to be sensitive to penicillin, it required 0.1 unit of penicillin per cubic centimeter of culture for inhibition. After two weeks of penicillin therapy in a dosage of 1,600,000 units daily, the bacterial resistance increased so that 60 units of penicillin per cubic centimeter of culture was required for in vitro inhibition. A "septic" course persisted despite an increase to 10 million units of penicillin daily. In addition to ulcerative, vegetative mitral valvulitis, septic infarcts of the heart, liver, spleen and kidney were noted at autopsy.

There are various reports of increasing in vitro resistance of staphylococci to penicillin.[1, 2] Barber[1] in 1946 reported that 14.1 per cent of staphylococci examined were penicillin-resistant, requiring more than 10 units of penicillin per cubic centimeter of culture for in vitro inhibition. The same investigator reported that by June 1948 in the same hospital the incidence had increased to 59 per cent.

Two of the remaining four patients who died (Cases 8 and 9, Table 2) did so within 24 hours after onset of illness, and in both cases acute ulcerative vegetative aortic valvulitis was noted at autopsy. Multiple abscesses of the myocardium, liver, spleen, kidney and brain were observed in one case, and a massive cerebral embolus in the other. In Case 6 penicillin in amounts ranging from 800,000 to 2,400,000 units daily was given. Sensitivity studies were not done in this case because tests were not yet available. At postmortem examination, acute ulcerative vegetations were noted on the mitral valve, and septic infarcts of the brain, kidney and spleen were present. In Case 7, endocarditis was not diagnosed during life. The patient was treated for pneumonia and received 320,000 units of penicillin daily. At postmortem examination, acute ulcerative vegetations were observed in the aortic valve. Cultures of the vegetations were reported as Staphylococcus aureus, coagulase-positive. Multiple abscesses of the liver, kidney and bone were also present.

Increasing Resistance to Aureomycin. A fatal case of Staphylococcus aureus endocarditis which was observed by one of the authors (Griffith) at another hospital has been included in this report. The organism was initially resistant to penicillin and developed increasing resistance to aureomycin during therapy.

CASE REPORT

The patient, a 63-year-old white male physician (Case 6, Table 2) complained of chills and fever of 24 hours' duration. A blood culture was positive for Staphylococcus aureus and the patient was hospitalized. Bacterial sensitivity studies showed that either 180 units of penicillin, 5 micrograms of aureomycin, or 8 micrograms of streptomycin per cubic centimeters of culture were required for in vitro inhibition of the organism. Aureomycin was considered the drug of choice and it was given orally in a dosage of 1 gm. every four hours for two days, following which it was given intravenously in a dosage of 0.3 gm. every six hours for the next three days. When the temperature remained elevated, the dosage was increased to 0.5 gm. intravenously every six

hours. Blood cultures remained positive and 8 micrograms of aureomycin per cubic centimeter of culture was required for in vitro bacterial inhibition. The aureomycin dosage was increased to 1 gm. intravenously every six hours, and within three days the temperature returned to normal. Blood cultures were still positive, and resistance of the organism had increased so that 40 micrograms of aureomycin was required for in vitro bacterial inhibition. The patient died 11 days after the onset of illness. A large patch of ulcerating vegetation originating on the anterior median leaflet of the aortic valve and extending to involve the atrial septum was noted at autopsy. Septic infarcts were present in the spleen and kidneys.

Comment: The bacterial resistance to aureomycin in this case suggests that increasing resistance of various strains of staphylococci to aureomycin will be encountered.

Cures of Staphylococcus Aureus Endocarditis. Three of the nine patients with Staphylococcus aureus endocarditis were cured (Table 2). In Case 1, the organism was sensitive to penicillin and response to treatment with that drug was good. In case 2 the organism was extremely resistant to penicillin; 200 units per cubic centimeter of culture was required for in vitro bacterial inhibition. The patient was given 20 million units of penicillin daily, without response. By further sensitivity studies it was determined that the organism was inhibited by 1 microgram of aureomycin per cubic centimeter of culture. Aureomycin was then given in a dosage of 1 gm. every four hours, and within 24 hours the temperature was normal. The aureomycin was continued for 21 days. Repeated blood cultures then were negative for the organism. The patient in Case 3 was originally admitted in 1946, Staphylococcus aureus endocarditis was diagnosed, and remission promptly followed the giving of penicillin. Two years later the patient reentered with Staphylococcus aureus endocarditis. The organism was extremely resistant to both penicillin and streptomycin. 180 units of penicillin or 62 micrograms of streptomycin per cubic centimeter of culture was required for inhibition in vitro. When 20 million units of penicillin daily brought no response in the patient, aureomycin sensitivity studies were done and the organism was found sensitive to 1 microgram of aureomycin per cubic centimeter of culture. Aureomycin was given, 1 gm. every four hours, and dramatic improvement and cure followed.

Staphylococcus Albus Endocarditis

Fatal Cases. In nine of the 18 patients with staphylococcal endocarditis, the etiological organism was Staphylococcus albus. Six of the nine patients died (Table 3). In Table 3 bacterial sensitivity studies are correlated with the therapeutic response. Although in one of the cases in which death occurred the organism was sensitive to penicillin, which effected a remission, the patient died of heart failure during a recurrence. In Case 15 the organism was moderately resistant to penicillin; 1 unit of penicillin per cubic centimeter of culture was required for in vitro bacterial inhibition. The patient received penicillin, but died four days after onset of therapy. Postmortem examination was not done, but it was thought that the patient had a cerebral mycotic aneurysm which had ruptured. Aureomycin was not available for sensitivity studies or treatment in any of these fatal cases. Case 19 (Table 3) is an example of failure of treatment owing to increased bacterial resistance to penicillin. One week after the patient was admitted a blood culture was reported positive for Staphylococcus albus (coagulase-positive). Six subsequent cultures were also positive. In sensitivity tests the organism was not inhibited in vitro by 100 units of penicillin per cubic centimeter of culture, or by 40 mg. of sulfadiazine per 100 cc. Growth was inhibited by 25 micrograms of streptomycin per cubic centimeter of culture. It was calculated that this would require 3 gm. of streptomycin every three hours to obtain a therapeutic level. Despite administration of sulfadiazine and 1 million units of penicillin daily, the fever persisted, and the course was progressively downhill. The patient became comatose and died on the 29th hospital day. Permission for a postmortem examination was refused.

Cures. Three patients with Staphylococcus albus endocarditis were cured (Table 3). In two of these cases (Cases 11 and 12) the organism was peni-

TABLE 3.—*Bacterial Sensitivity Studies and Therapeutic Response to Antibiotics in Staphylococcus Albus Endocarditis*

*Case No.	Bacterial Sensitivity (Concentration per cc. of culture for in vitro inhibition) Penicillin (Units per cc.)	Streptomycin (Micrograms per cc.)	Aureomycin (Micrograms per cc.)	Therapy and Response
11.	.1	....	....	Penicillin—cure.
12.	.5	1	2	Penicillin—cure.
13.	3	....	1	Penicillin and aureomycin—cure.
14. a.	.1	....	....	a. (Initial admission). Penicillin; sterile cultures for two weeks only.
b.	.2	....	....	b. Penicillin for recurrence; heart failure—died.
15.	1	....	....	Penicillin; died four days after admission.
16.	6	....	....	Penicillin—died.
17.	12	250	....	Penicillin—no response; died.
18.	12	30	....	No therapy—died (heart failure).
19.	100	25	....	Penicillin—no response; died.

*Cases 11 to 17—Staphylococcus albus, coagulase-negative; Case No. 18—Staphylococcus albus, coagulase-positive.

TABLE 4.—*Bacterial Sensitivity Studies and Response to Antibiotics in Staphylococcus Albus Bacteremia*

Diagnosis	Bacterial Sensitivity* (Concentration per cc. of culture for in vitro inhibition) Penicillin (Units per cc.)	Aureomycin (Micrograms per cc.)	Bacitracin (Units per cc.)	Therapy and Response
1. Septicemia	180	2	....	Penicillin—no response. Aureomycin—cure.
2. Septicemia	6	2	8	Penicillin—no response. Aureomycin—cure.
3. Mastoiditis	80	2	2	Aureomycin—cure.

*Cases 1 and 2—Staphylococcus albus, coagulase-negative; Case 3—Staphylococcus albus, coagulase-positive.

cillin-sensitive, and when the drug was given to the patient there was remission of the disease. In Case 13 the organism was resistant to penicillin but relatively sensitive to aureomycin (see Table 3). Therapy consisted of penicillin in a dosage of 2 million units every three hours intramuscularly and 1 gm. of aureomycin every six hours. Within 24 hours after the beginning of therapy the temperature became normal. After four days, aureomycin was distinued because of severe nausea and vomiting. Penicillin was discontinued after three weeks. Repeated blood cultures thereafter were negative.

Three cases of Staphylococcus albus bacteremias have also been included in this report, as in all cases there was pronounced bacterial resistance to penicillin but sensitivity to aureomycin (Table 4). In two cases there was a dramatic response to aureomycin after penicillin therapy had failed. In the third case studies of sensitivity of the organism to both penicillin and aureomycin were promptly carried out, and as a result aureomycin therapy was initiated early.

DISCUSSION

Staphylococcal endocarditis as observed at the Los Angeles County Hospital has differed sharply from the more common streptococcal endocarditis. The mortality rate over a three-year period was 66 per cent in the cases of staphylococcal infection and 20 per cent in cases in which streptococci were the infecting organisms. This pronounced difference in mortality rate is attributed to the high incidence of penicillin-resistant staphylococci grown on cultures in the group. A contributing factor to the high mortality rate was that in the patients who died of Staphylococcus aureus endocarditis the course of the disease was rapid and fulminating, with early development of septic infarcts and abscesses in the myocardium, kidney, spleen, brain, etc.

In vitro bacterial sensitivity studies were done in 15 of the 19 cases reviewed. In ten cases (66 per cent) the organism was relatively resistant to penicillin; from 1 to 200 units of penicillin per cubic centimeter of culture was required for in vitro inhibition. Studies to determine aureomycin sensitivity were done in four cases in which the organism was penicillin-fast. In three cases the infecting agent was sensitive to the drug; 1 microgram of aureomycin per cubic centimeter of culture inhibited growth in vitro. Two of the four patients had Staphylococcus aureus endocarditis (Cases 1 and 2) and there was no response to large doses of penicillin. Both were afebrile 24 hours after administration of aureomycin was started. In one case (Case 6) increasing resistance to aureomycin developed during therapy. Initially 5 micrograms of aureomycin per cubic centimeter of culture was required for in vitro inhibition. At the end of ten days of aureomycin therapy the amount necessary had increased to 40 micrograms.

The sensitivity studies and therapeutic responses herein reported suggest that aureomycin may be effective when bacterial resistance to penicillin is encountered. The experience in Case 6 indicates that staphylococcal resistance to aureomycin may develop. There seems to be a synergetic action between penicillin and streptomycin. No renal blocking agents such as caronamide were used in this series of patients.

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Private Practice-Health Department Relationships

How Can They Be Improved?

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THE preparation of this paper has not been a pleasant task. I have written it reluctantly. My reluctance was due to the fear that it might be misunderstood by that fine group, the physicians of my own county, in whose concept of the mutual relationships and responsibilities of private practice and public health I can find little to criticize. Some conclusions that I have reached cast doubt on the wisdom of certain announced policies of the organized profession of which we are all a part. I admit to some presumption in questioning the judgment of men whose identity I do not know but who are presumably wiser and probably older than I am.

An honest, courageous and objective approach to the problems of the medical profession is essential if it is to advance as a profession and fulfill its responsibilities to the public. Deference and esteem must not be permitted to prevent a critical examination of the strengths and weaknesses of the profession of medicine and the interrelationships of physicians in various fields of practice. No one has better stated the need for a lively exchange of ideas and points of view than William Osler:[3]

"No class of men needs friction so much as physicians; no class gets less. The daily round of a busy practitioner tends to develop an egoism of a most intense kind, to which there is no antidote. The few set-backs are forgotten, the mistakes are often buried, and ten years of successful work tend to make a man touchy, dogmatic, intolerant of correction, and abominably self-centered. To this mental attitude, the Medical Society is the best corrective, and a man misses a good part of his education who does not get knocked about a bit by his colleagues in discussions and criticisms."

Every physician who examines the national scene today is amazed and alarmed at the situation we find ourselves in. At the very moment that medical scientists are heaping life-saving discoveries into the lap of suffering humanity, the purveyors of these blessings are being abused and maligned as exploiters of human suffering. In a word, it seems that we have never seen a time when medical science has stood so high, and the medical profession stood so low in public esteem. There is reason to suspect that those who most actively support the complete socialization of medicine recognize that "a house divided against itself cannot stand" and are, therefore, anxious to promote misunderstanding and distrust within our ranks. Barriers built by well-meaning persons within our profession lend more than ordinary "aid and comfort to the enemy." Broad understanding, mutual respect, and common objectives are, now, more urgently needed than ever.

As preface to discussion of current problems, it is necessary to look briefly into the past of American medicine. Shortly after the beginning of the "era of discovery" which began with Pasteur and Koch, the halls of American medicine rang with the debate on the question of whether the American medical profession should be organized along guild lines or should be a democratic institution. The proponents of guild practice believed that it was futile to attempt to bring the advantage of medical science to all the people and urged that the training of physicians be restricted to the number that could be supported by those able to pay—much as is done in Cuba and some other Latin-American countries today. The proponents of democratic organization held that as a part of the world's greatest and most democratic country, the American medical profession could do no less than assume the responsibility for bringing the benefits of medical science to all the people. To approach this ambitious objective, medical schools were to accept and train students up to their capacity until every community in the land was served by competent physicians. Medical texts were to be available to all, either in libraries or by purchase, and physicians were to minister to all without regard for ability to pay. Eventually, the forces of democracy prevailed and the medical profession embarked on the effort to serve all the people. At that moment, socialized medicine was born in the sense that medicine was recognized as a social science.

During this same period, the discoveries which we now know as the foundation of modern bacteriology were being given to the world. With each new discovery the imagination of the profession and of the public at large was fired with the possibilities for benefit in the new knowledge. The public attitude toward disease changed. It was realized that affliction with certain diseases was no longer the inexorable fate of mankind, or the wage of original sin, but that diseases were tangible enemies which could be defeated with proper organization and adequate finance.

A concomitant result of change in attitude was the development known as the voluntary health agency. The Gunn-Platt[1] report, "Voluntary Health Agencies—an Interpretive Report," published in 1945, summarizes the beginnings, as follows: "There is, first of all, the American tradition of freedom—freedom of expression and inquiry, freedom of association and initiative. The second factor is our

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common aggressive attitude toward all sorts of problems and situations. We are generally dynamic and pragmatical; we prefer doing something to merely talking about it, to merely waiting for something to happen." Quoting from this report still further: "The voluntary health movement has had its full flowering in the United States. Nowhere else in the world has this type of service developed to such extent or in such variety. It is truly an extraordinary expression of the goodwill and neighborliness of the American people, their generosity and their genius for organization." More about these organizations later. (The Gunn-Platt report should be required reading for all American physicians.)

The second significant result of the "age of discovery" in bacteriology was the resurgence of public health and the birth of preventive medicine. As Sir William Osler[5] said in 1910: "A blundering art until thirty or forty years ago, preventive medicine was made a science by the discovery of the causes of many of the serious epidemic diseases." These discoveries plus the new knowledge of sanitary science transformed the health officer from a witch hunter to a scientist almost overnight; and, under the strong stimulus of the voluntary health agency, public health grew by leaps and bounds. Again quoting the Gunn-Platt report: "The voluntary health agencies, acting in the spirit of our kind of democracy, have often found themselves undertaking to guard the common interest by defending and promoting, and when necessary criticizing the public health institutions and officials."

To summarize, at half century we live in a society which is greatly interested in medicine, in the alleviation of human suffering, in the social implications and economic penalties of disease and, particularly, in what mankind can do to improve its lot through preventive medicine and public health. This is the millennium which medical statesmen of 1900 dreamed about and wished for. What have we done with the opportunity? Accomplishments such as the reduction in mortality from the communicable diseases, reduced infant and maternal mortality and a steadily increasing span of life are noteworthy. But have we lived up to the best that's in us? Have we been petty and contentious; jealous and arbitrary? Individually and collectively, we are all candidates for public approval. Have we conducted ourselves as though we desired and hoped to receive this approbation or have we been hostile, critical and obstructive?

Let us ask certain questions of the health officers, first. These questions will be embarrassing to some of them.

1. In planning the department's program, have you given major emphasis to the "Basic Six"? (Vital statistics, communicable disease control, maternal and child health, environmental sanitation, health education, and public health laboratory facilities.)

2. Have you allowed yourself to be sold on various special programs to the detriment of any basic services?

3. Have you worked diligently for adequate staff and physical facilities?

4. Have you devoted yourself to the job of educating, advising and guiding the various voluntary health agencies of your community to the end that their resources are more logically and more effectively utilized?

5. Do you and your staff recognize your responsibility to give every assistance to the private (family) physician who is "the man up front" in the battle to protect the public's health?

6. Do you and your staff realize that public confidence, respect and esteem are not your right by virtue of position but must be purchased with competent service and devotion to the common good—often "above and beyond the call of duty"?

And now, in turn, the private practice of medicine should provide more acceptable answers to the following questions:

1. Have you interested yourself in your health department (its personnel, its facilities and its services) and have you actively cooperated with it in the control of communicable disease?

2. Do you actively support your health officer in his efforts to obtain better personnel, modern facilities, more adequate budgets, or are you passive and inactive in such matters?

3. Is your health officer an ex-officio member of your society's board of managers? If he is capable, he will welcome your advice; if he is incompetent, he needs your help.

4. Is the medical citizenship at local level consistent with state and national policy? Remember that "high-sounding phrases" not supported by appropriate action are interpreted as duplicity by the public.

5. Do you actively participate in the work of the voluntary health agencies—attending regularly, serving on advisory boards, aiding and guiding them to more logical programs? Remember that confidence and goodwill for yourself and the profession can be built only in this way.

6. Do you actively participate in all efforts to establish community health councils, or their equivalent, which are designed to evaluate health programs and promote efficiency and eliminate waste in this field? It is difficult to understand why this activity has had so little effect at local level.

In closing, may I express my surprise at the conflict between Point 9 of the National Health Program,[3] as adopted by the Board of Trustees and the Council on Medical Services of the American Medical Association on February 14, 1946, and the attitude of the California Medical Association toward voluntary welfare agencies.

Point 9 of the National Health Program reads as follows:

"9. The services rendered by volunteer philanthropic health agencies such as the American Cancer Society, the National Tuberculosis Association, the

National Foundation for Infantile Paralysis, Inc., and by philanthropic agencies such as the Commonwealth Fund and the Rockefeller Foundation and similar bodies have been of vast benefit to the American people and are a natural outgrowth of free enterprise and democracy that prevail in the United States. Their participation in a national health program should be encouraged, and the growth of such agencies when properly administered should be commended."

By contrast, the Resolution on Voluntary Welfare Agencies[2] adopted by the Council of the C.M.A. November 20, 1949, reads as follows:

"Resolved: That the California Medical Association on and after July 1, 1950, shall require review by the Council of all programs of the above type [those conducted by voluntary agencies] which are conducted in this state and which depend on the services of the medical profession for their successful operation, said review to be obtained within six months of the effective date of this resolution."

Item 1 of the policies recommended by C.M.A. for voluntary agencies reads in part:

"There should be an adequate number of physicians on the governing board of the agency in order to render sound medical guidance. There should be a segregation of functions of the board, and that portion of the board or subcommittee of the board dealing with medical problems should have at least 50 per cent of its members chosen from practicing physicians licensed in the territory or state in which the agency functions or proposes to function."

As public relations, the resolution strikes the author as the way *not* to "win friends and influence people." We cannot "require" review of anything.

As to the recommendation that an "adequate number of physicians" sit on the governing boards of these agencies, may I say that the fine public-spirited citizens who serve on these boards have tried everything short of kidnapping to get doctors to serve on boards and medical advisory committees. Why don't we admit frankly that as physicians we are not living up to the responsibilities of democratic citizenship? The last meeting of the medical advisory committee of one of our principal voluntary health agencies in Orange County was attended by the author and one other physician. The answer to the problems of the voluntary health agency is not to be found in angry tirades and absent treatment.

A word of warning to all of us comes from the pen of Sir William Osler:[6] "Professional work of any sort tends to narrow the mind, to limit the point of view, and to put a hallmark on a man of a most unmistakable kind."

Court House Annex.

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Funnel Chest (Pectus Excavatum) in Infancy and Adult Life

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SUMMARY

Funnel chest, unless corrected, may lead to cardiorespiratory distress or psychic problems or both. Since operation to correct the deformity is relatively simple in infancy and much more extensive if done later, early surgical intervention is indicated. If the condition is not noted until the patient is beyond infancy, cardiorespiratory studies will aid in determining the advisability of operation.

THE rhythmic inspiratory retraction of the distal portion of the sternum and lower thoracic cage, rather frequently noted in infancy, may disappear as the infant develops. Persistence of this physiologic phenomenon results in the permanent inward displacement and fixation of the inferior segments of the sternum and adjacent cartilages and ribs. This deformity is spoken of as funnel chest, trichterbrust or pectus excavatum.

In a previous communication[1] one of the authors outlined simple corrective measures to be employed in infancy, and it was suggested that those measures "should at least prevent the full development of the deformity, thereby obviating the necessity of a major procedure later in life." Fourteen years' experience by the authors and the experience of other investigators[4, 6] have confirmed that hope. At the

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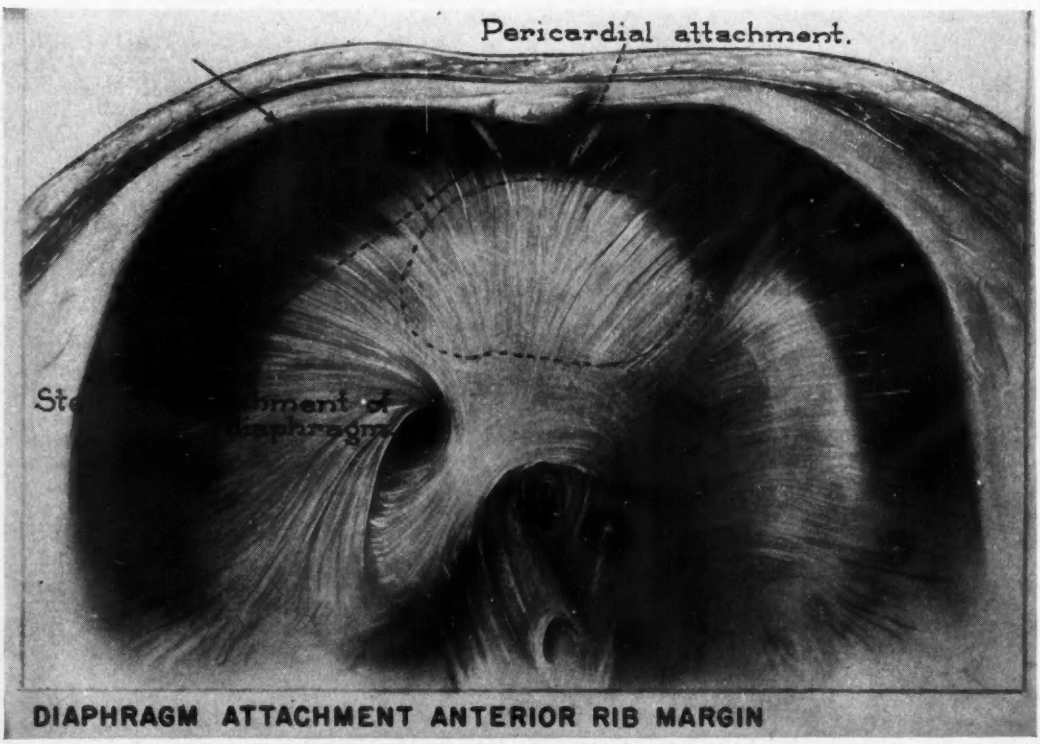


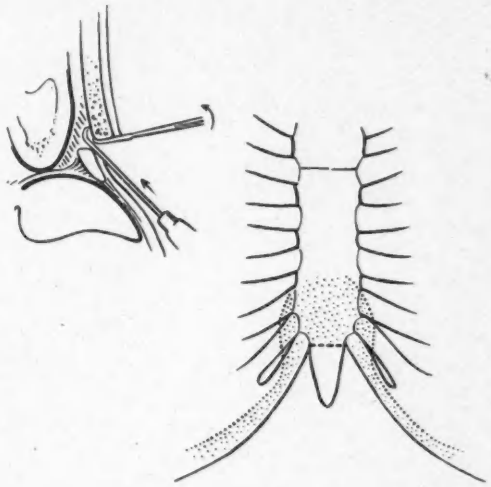
Figure 1.—View of the diaphragm from above, showing the direction of the muscle fibers. It is to be noted that the majority of the anteroposterior pull is directly beneath and adjacent to the sternum.

time of the communication mentioned, the author was concerned only with the correction of the visible deformity. Since then, however, it has been observed that persistence of the deformity may cause psychic injuries which are often of far greater gravity than the structural abnormality. Although the visible deformity, and to a great extent any attendant psychological problem, can be corrected by procedures after infancy, such measures seem never to fully repair the underlying injuries (cardiorespiratory). Since the operative procedure in infancy has thus far proved not only to be safe and simple but also to achieve the desired results, operation early in life seems advisable.

A common misconception is that rickets is an etiologic factor in funnel chest. Actually funnel chest has never been reported in an authenticated case of rickets. The authors believe pectus excavatum to result from a neuromuscular imbalance whereby the anteroposterior fibers of the diaphragm in particular are overstimulated (Figure 1). The entire process may perhaps be likened to pylorospasm of infancy. The distal end of the sternum is retracted, carrying along with it the contiguous cartilages and ribs. Finally the diaphragm becomes permanently shortened in its anteroposterior diameter, thereby retaining the sternum in a depressed state, and as growth progresses, the cartilages and ribs permanently conform to the retracted position of the sternum. The retraction of the anterior chest wall decreases the anteroposterior diameter of the chest, produces pressure upon or displacement of the heart, pressure upon the mediastinal vessels and structures, a decrease in the volume of the thoracic cage and an exaggerated dorsal curve with apparent abdominal protuberance. Funnel chest is commonly associated with congenital or hereditary defects. The cardiorespiratory manifestations are rarely if ever noted in infancy. When they do ensue, they tend to be more severe in those instances in which the heart is fixed beneath the sternal depression.

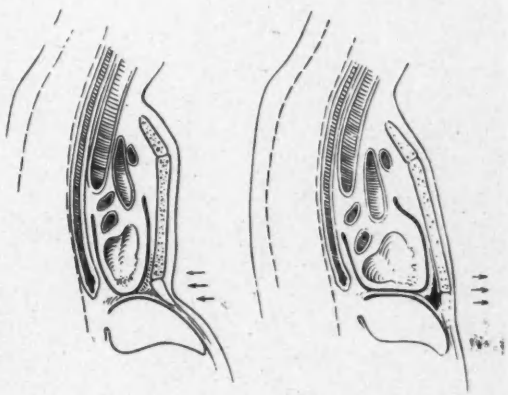
The indicated surgical procedure in infancy is now obvious—free the distal sternum from the pull of these overstimulated muscle fibers (Figures 2 and 3). The junction of the sternum and xiphoid is transected along with the substernal ligament. Then the sternal and immediately adjacent cartilaginous and rib attachments of the diaphragm are detached with the aid of a periosteal elevator. This permits the diaphragm to lengthen in its anteroposterior diameter and prevents the sternum from being pulled upon. The entire procedure is carried out through an incision of about 3 to 4 cm. and requires approximately ten minutes. To attain a satisfactory result this minimal operative interference must be boldly performed (Figures 4 and 5).

Operative interference in infancy is simple and obviates a major surgical procedure in later life. Experience has shown that the optimum time for the simple operation is when the patient is approximately 18 or 20 months of age. By then it is reasonably certain that the condition will persist, yet no fixation has taken place. In cases in which the simple operation was not done until after the end of the second year, results usually were unsatisfactory. The authors wish to stress, however, that their advocacy of early intervention is not primarily because of the greater magnitude of operation re-



SEPARATION OF STERNAL AND LOWER ANTERIOR RIB ATTACHMENTS OF DIAPHRAGM

Figure 2.—Operative procedure in infancy. The dotted area shows approximately the extent of the area from which the attachment of the diaphragm should be freed.



RELATION OF PARTS BEFORE AND AFTER SEPARATION OF ANTERIOR DIAPHRAGM ATTACHMENTS

Figure 3.—Diagrammatic representation of the relief of the retraction of the distal end of the sternum and the lengthening of the diaphragm in the anteroposterior diameter after operation.

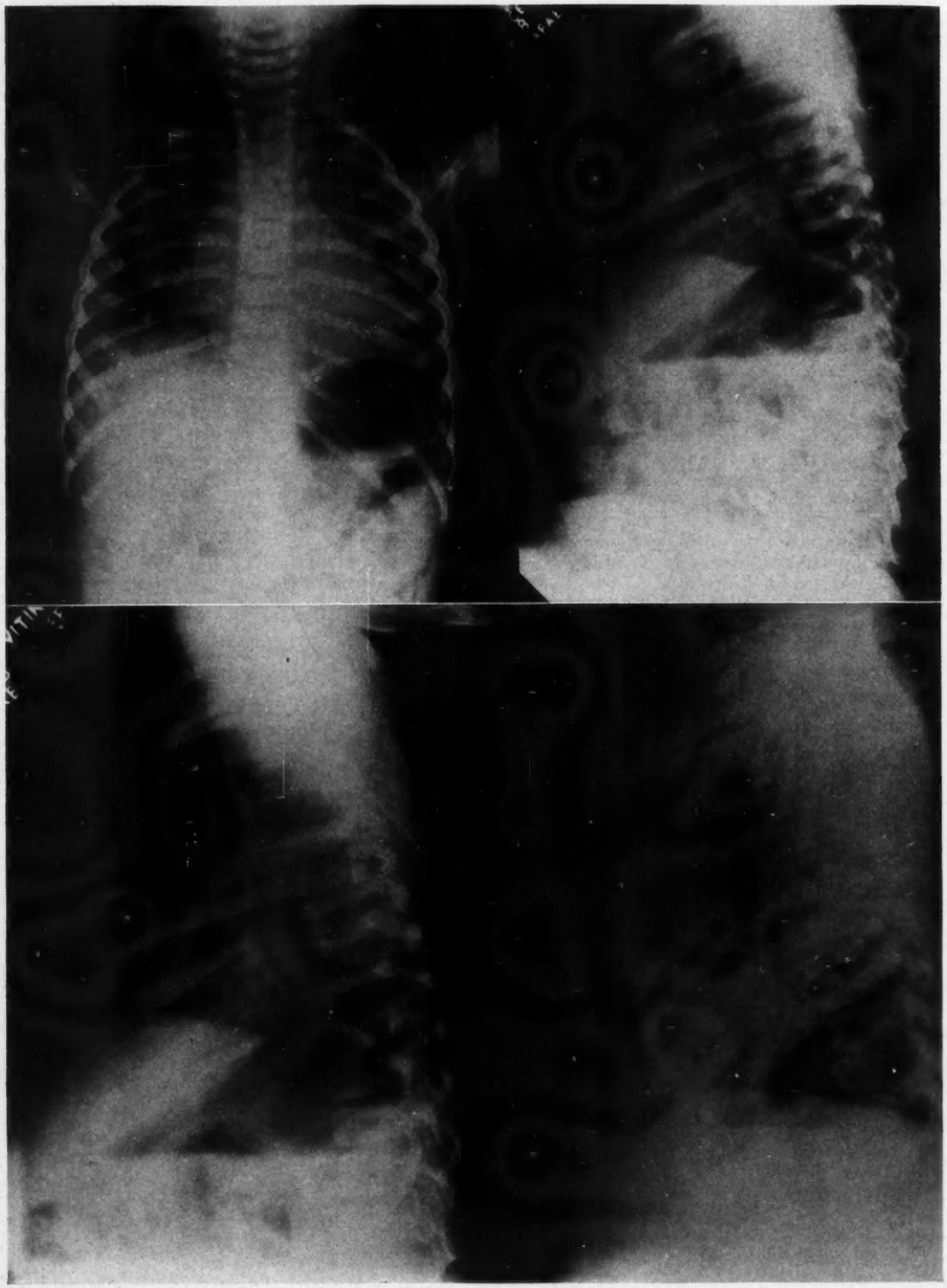


Figure 4.—*Upper:* X-ray films of patient 20 months of age, showing heart in mid-position and retraction of sternum pressing directly thereon. *Lower:* Comparative x-ray films before and after operation, showing release of sternum.

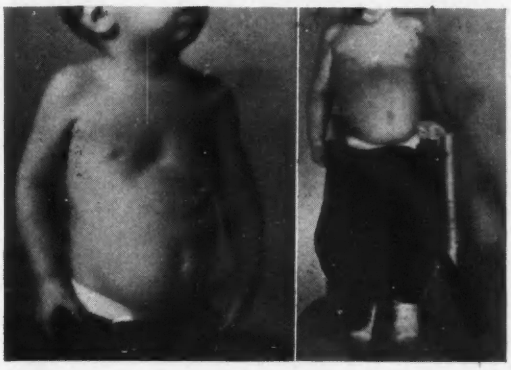


Figure 5.—Patient (Figure 4) before and after operation.

quired later, but because of sequelae which often ensue and coexist with fully developed funnel chest. Although some persons who have the deformity may have no sequelae, the majority do have resulting infirmities which cripple them to a greater or lesser extent and seriously shorten life expectancy.

During the past two years the authors have made cardiorespiratory studies[2] along the lines of those suggested by Cournand[3] which bear this out. Of the adults with funnel chest who were studied, more than 70 per cent had abnormal electrocardiogram tracings (altered axis deviation, although usually present, was not included as an abnormality in arriving at that percentage figure).

The maximum breathing capacity (and this proved to be the simplest and most informative test of cardiorespiratory efficiency) averaged less than 50 per cent of normal in the series. Interest-

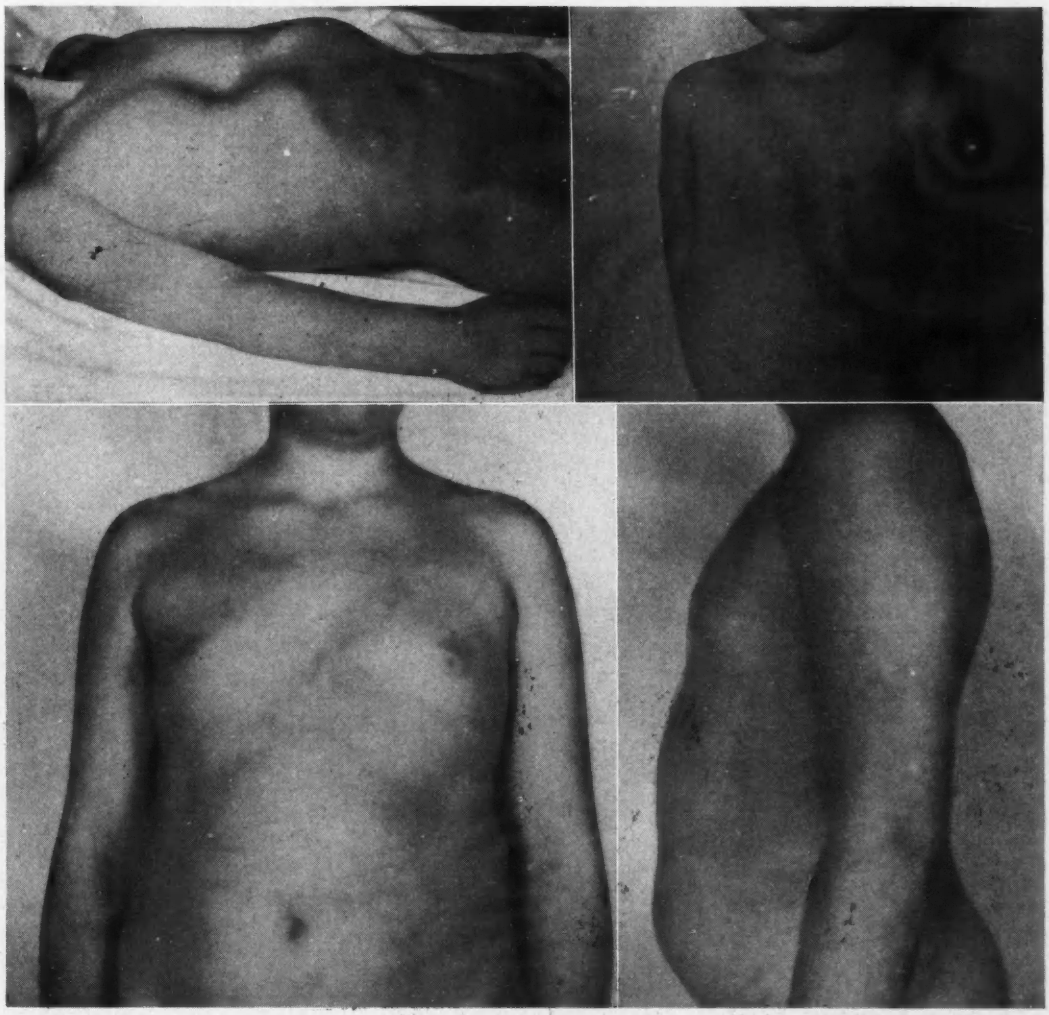


Figure 6.—Photographs of patient, showing condition before operation, immediately after operation and 14 years later.

ingly, it was noted that in borderline cases—those in which there was fully developed deformity of the chest but no cardiorespiratory symptoms—there was sometimes a lowered maximum breathing capacity. Further, these same patients in a matter of six to twelve months became conscious of some respiratory embarrassment. Comparison of preoperative and postoperative maximum breathing capacity determinations gives a working index of the benefits of operative intervention in this regard. In the authors' series an average increase of about 35 per cent was observed.

The cardiorespiratory disease simulates and may finally become true cor pulmonale. The symptoms usually appear toward the end of the second decade or during the third decade of life. They are then of such nature as to be at least incompletely reversible.

In five instances in which psychic factors were the indication for correction of the deformity, operation satisfactorily solved the problems. Two of the patients, one male and one female, had delayed marriage because of embarrassment over the malformation. Another patient, a girl 15 years of age, was completely asocial and unhappy before the deformity was corrected. Two young men who felt unable to join their fellows in any kind of recreation in which the chest was bared were relieved of this embarrassment. Robb[6] reported similar experience, and Lester[4] reported psychic problems even in children four or five years of age. In no case observed by the authors has the operative scar been of psychic significance.

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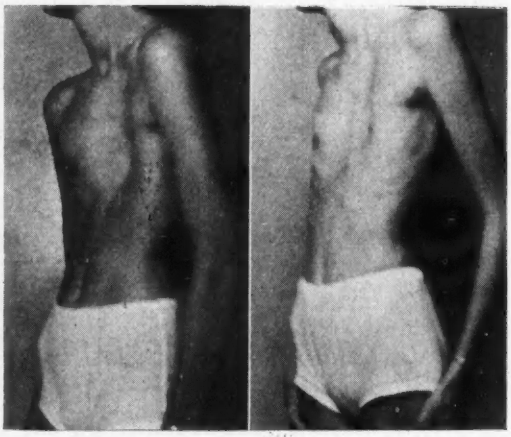

Figure 7.—Funnel chest complicated by malposition of the diaphragm on the right and displacement of the heart into right upper chest, treated by modified operation.

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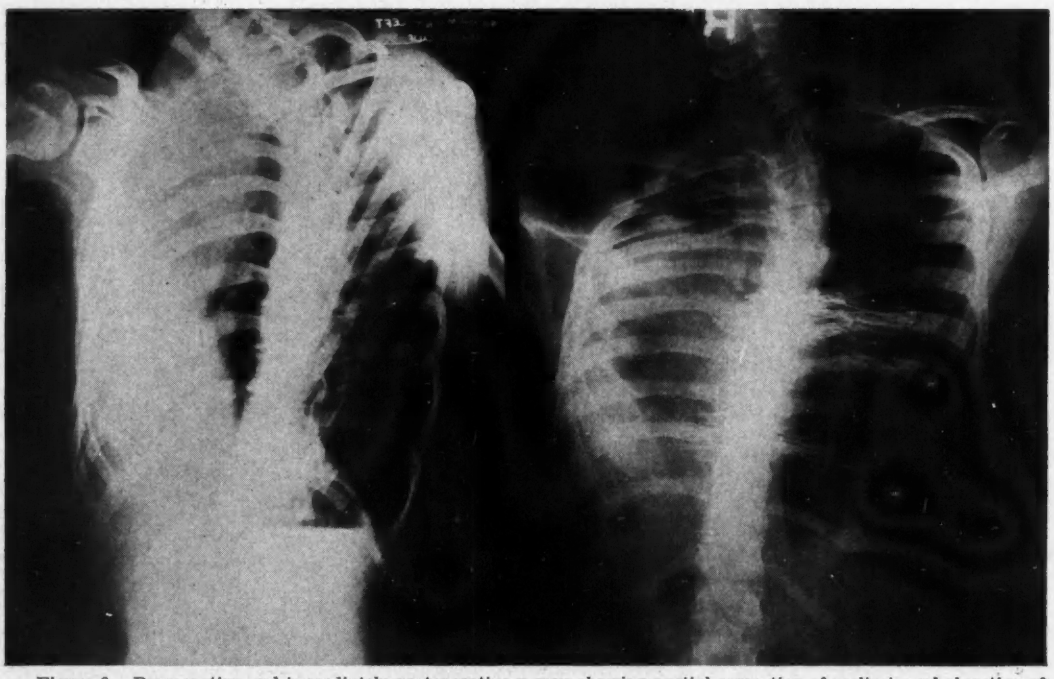

Figure 8.—Preoperative and immediately postoperative x-rays showing partial correction of scoliosis and elevation of the left shoulder, increase in capacity of the left thoracic cage.

The California Tumor Registry

LESTER BRESLOW, M.D., JAMES W. ELLIS, M.D., MARTHA C. EATON, SC.M., and GOLDY D. KLEINMAN, M.A., *Berkeley*

SUMMARY

The California Tumor Registry, in which 71,215 cases have been entered, provides data for professional and public education which is specific to the state. It has suggested leads for epidemiological investigation of cancer. Participating agencies are assisted in maintaining adequate follow-up systems through annual listing of cases by the State Department of Public Health and removal from the list of cases in which death occurs. Among the first cases analyzed, the diagnosis was confirmed microscopically in 70.6 per cent. Only 36.2 per cent of patients had visited a physician within two months after onset of symptoms. Survival of patients with cancer is compared with their expectancy calculated from life-tables, thus taking account of deaths from causes other than cancer.

THE California Tumor Registry was initiated in 1947 by the State Department of Public Health with the support of the Cancer Commission of the California Medical Association, the Association of California Hospitals and the California Associations of Medical Record Librarians. It is based upon voluntary reporting of cancer cases and follow-up information on standard forms by participating hospitals, clinics, and physicians. The registry roster is checked against the vital statistics index of the State Department of Public Health so that the death of any patient (from any cause) will be known. Participating agencies report follow-up annually on all patients not known to be dead.

At present, cases are reported by 37 hospitals, both public and private, representing 43.7 per cent of the beds for acutely ill patients in the larger general hospitals in the state—that is, institutions having 50 or more beds. These participating hospitals are located in 12 counties. All except one of the teaching hospitals in the State are included. Reports are also received from a few clinics and physicians in private practice. As of April 24, 1950, reports received from all participating agencies totaled 71,215.

The registry provides a valuable source of information, specific to California, for public and professional education. It suggests leads for epidemiological investigation. It assists in the establishment and maintenance of adequate medical follow-up systems. It aids in the objective evaluation of cancer control programs.

The data to be presented are limited to the 1942-1948 reports from ten hospitals which have completed reporting the cases of all patients admitted for cancer during that period. The information on the form reported to the Tumor Registry summarizes the data on each patient during his first admission for cancer. There were 21,341 unduplicated cases in this series. In 15,059 cases (70.6 per cent) the diagnosis was microscopically confirmed. Some hospitals report questionably malignant as well as clearly malignant types of neoplasm and other hospitals report only clearly malignant types.* Among the 15,059 microscopically confirmed cases in the series, there were 11,502 neoplasms of the clearly malignant types—the types reported by all hospitals. The major portion of the following analysis is restricted to these 11,502 cases—a series uniform as to types of neoplasm included and valid through confirmation of diagnosis by pathologic examination.

In public and professional education concerning cancer extensive use has been made of mortality statistics. Although helpful, such data do not give the full story. For example, mortality statistics cannot be used to determine the relative incidence of cancer in the various sites of the body. Table 1 shows the relative incidence of cancer in certain accessible sites compared with deaths due to cancer of the same sites. It will be noted that cancer of the skin and other accessible sites shows up more prominently in the reported cancer cases than in the cancer deaths. If neglected, cancer of the accessible sites results in death just as certainly as does cancer of the non-accessible sites. Hence, this table suggests that some patients with cancer of the accessible sites are being treated successfully—that is, they do not die of cancer. From this, it is ap-

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From the California State Department of Public Health, Berkeley.

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*Reportable types are as listed in Standard Nomenclature of Disease and Standard Nomenclature of Operations, American Medical Association, Chicago, Ill., March 1948, pp. 87-91, 135, 249, 261; types are specified as malignant according to the Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, Sixth Revision, World Health Organization, Geneva, Switzerland, 1948, pp. 75-79.

TABLE 1.—*California Tumor Registry, 1942-1948: Percentage Distribution of Reported Cancer Cases and Cancer Deaths, Three-Year Average 1946-1948, for Selected Sites.*

Selected Sites	All Reported Cancer Cases	Microscopically Confirmed Cancer Cases	Cancer Deaths*
All sites:			
Number	21,341	11,502†	14,233
Per cent	100.0	100.0	100.0
Buccal cavity and pharynx	5.0	7.1	2.6
Rectum	6.1	8.0	5.4
Breast	11.6	10.5	10.0
Cervix uteri	8.5	10.5	4.1
Skin	8.7	13.0	1.7
All other sites	60.1	50.9	76.2

*State of California, Department of Public Health, Vital Statistics Records.

†Represents types of malignant neoplasm reported by all hospitals in this series.

parent that the actual incidence of cancer is not reflected in mortality data.

One of the most common misconceptions about cancer is that it is a disease exclusively of older people. It must be acknowledged that not only the public but even some physicians minimize the significance of cancer danger signals in young people. No one is too young to have cancer. Table 2 shows that cancer occurs at all ages. During the early and middle years of life females are more subject to cancer than males. Sixty-eight per cent of all cases of cancer in females in this series occurred in the ages 15 through 64; the corresponding percentage for males was 48.6.

TABLE 2.—*California Tumor Registry, 1942-1498: Percentage Distribution of Reported Cancer Cases Microscopically Confirmed, by Age at Initial Diagnosis by Sex.*

Sex	Total	Under 15 Years	15-44	45-64	65 and Over
Number years included:		15	30	20	20+
Total	100.0 (10,404)*	1.5	16.3	42.5	39.7
Male	100.0 (4,923)	1.9	10.2	38.4	49.5
Female	100.0 (5,472)	1.2	21.8	46.2	30.8

*1,098 cases, age not stated; 11 cases, sex not stated.

More than half of the reported cancers in females occur in accessible sites—nearly 40 per cent in the breast and cervix uteri (Table 3). The import of this is that cancer of these sites is particularly amenable to early diagnosis and successful treatment.

Epidemiological methods have been utilized to a very limited extent in the investigation of cancer. It is likely that much can be learned from the careful description of population segments which are especially affected by cancer of certain sites and from the isolation of factors which may be responsible for such higher incidence. Understanding of the etiology of cancer and ability to control it would be materially advanced through vigorous pursuit of this avenue of investigation. Leads for research of this type are found in the Tumor Registry.

TABLE 3.—*California Tumor Registry, 1942-1948: Percentage Distribution of Reported Cancer Cases Microscopically Confirmed, Selected Sites by Sex.*

Selected Sites	Total	Male	Female
All sites:			
Number	11,502*	5,467	6,024
Per cent	100.0	100.0	100.0
Buccal cavity	7.1	11.9	2.8
Rectum	8.0	9.5	6.7
Breast	10.5	0.3	19.8
Cervix uteri	10.5	....	19.9
Skin	13.0	18.5	8.0
All other sites	50.9	59.8	42.8

*Includes 11 cases sex not stated.

Table 4 presents the male-female ratio in cancer of the respiratory tract. It will be noted that cancer of the respiratory tract is more than seven times as common among males as among females. Rather than biological sex variation, this may reflect difference in environmental exposures. The California Department of Public Health is now conducting a study which may throw greater light on this problem.

TABLE 4.—*California Tumor Registry, 1942-1948: Primary Cancer of Respiratory Tract Microscopically Confirmed, by Sex.*

Sex	Neoplasms	
	Number	Per Cent
Total	307	100.0
Male	270	87.9
Female	37	12.1

In Table 5 and Chart 1 significant differences are revealed between white and non-white persons in cancer of the cervix and skin, whereas with regard to cancer at other sites there is no significant difference between the races. It seems possible that the relative infrequency of cancer of the skin among non-whites reflects some biological difference. This might be worth further investigation. In the case of cancer of the cervix, present knowledge suggests that lack of medical attention to the trauma of childbirth, nutritional deficiencies, and infectious diseases may play an important role in the higher incidence of this type of cancer among non-white females. These possibilities merit detailed epidemiological study. One profitable use of the observed difference in the relative frequency of cancer of the cervix is the directing of case-finding procedures (such as cytological techniques) toward the non-white population groups.

The Tumor Registry serves another important function in facilitating the establishment and maintenance of a comprehensive follow-up system by participating agencies. Such a system is important not only in the evaluation of methods of therapy but also for preservation of the health of the individuals concerned. Prompt discovery of recurrences may lead to significant reduction of morbidity and even mortality, just as in the follow-up of cases of tuberculosis.

Many hospitals, clinics, and physicians find that follow-up is burdensome, particularly because record systems do not readily provide essential information; patients change hospitals, clinics, and physicians; and many patients die unbeknownst to the follow-up agency. In the latter event, attempts at follow-up result in unnecessary and often embarrassing situations.

A tumor registry aids in overcoming these difficulties. The State Tumor Registry supplies each participating agency with photostatic copies of death certificates for cancer patients in the agency's purview who die in California. A listing of all patients known to have died and individual follow-up forms for all patients not known to be dead are supplied annually to each participating agency. These forms provide identifying information and the date the patient was last reported to be alive. After the follow-up information is obtained and recorded by the reporting agency, the form is returned to the Tumor Registry. With reports on a state-wide basis and machine processing of the records, a systematic and thorough follow-up system is made considerably easier for the reporting agencies.

TABLE 5.—*California Tumor Registry, 1942-1948: Percentage Distribution of Reported Cancer Cases, Microscopically Confirmed, Skin and Cervix Uteri, by Race.*

Race	All Sites	Skin	Cervix Uteri	All Other Sites
Total	100.0 (11,502)	13.0	10.4	76.6
White	100.0 (10,781)	13.7	9.6	76.7
Non-white	100.00 (638)	2.0	24.1	73.9

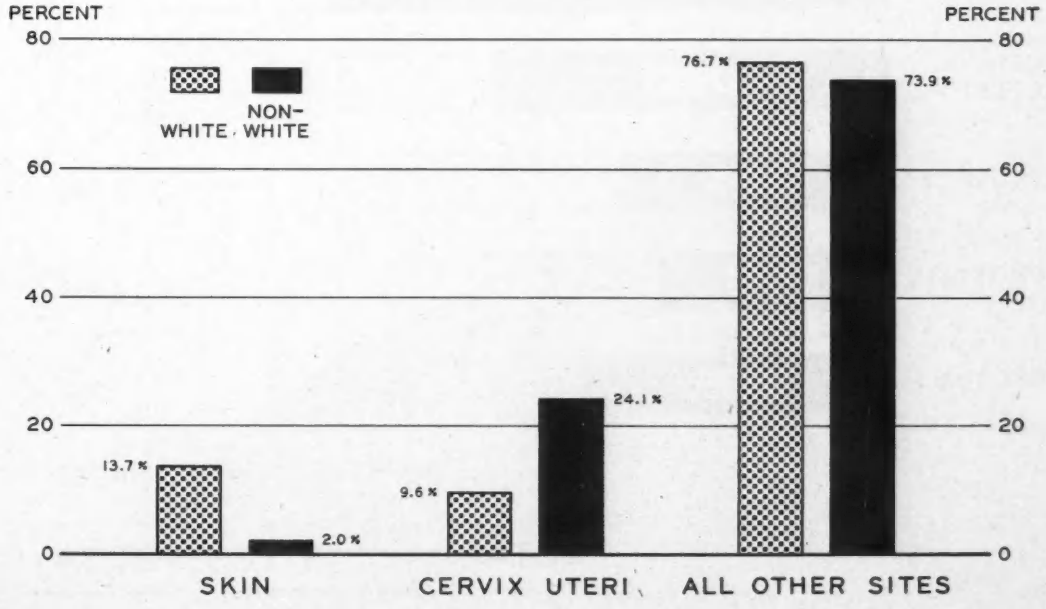
The extent to which patients with cancer actually can be followed may be of some interest. Four hospitals (one large county hospital and three private institutions) in the California Tumor Registry have completed reporting and following the reported cases for the period 1942-1948. It should be noted that this was a period of considerable migration and that follow-up activities were undertaken for the first time, in some cases, as long as seven years after the patient had been discharged from the reporting institution. In spite of this handicap, the

CHART 1

PERCENTAGE DISTRIBUTION OF REPORTED CANCER CASES SKIN AND CERVIX UTERI BY RACE

(MICROSCOPICALLY CONFIRMED)

CALIFORNIA TUMOR REGISTRY, 1942-1948



four hospitals succeeded in following up 96 per cent of all patients for a varying period of time either through contact with the patient or through notice of death. The large county hospital was able to follow 98 per cent of the patients it had reported. The three smaller private hospitals averaged 87 per cent.

One more point should be made in connection with Tumor Registry follow-up. Information obtained by the medical staffs of hospitals on groups of cancer cases reported and followed should influence the methods of care of patients with cancer. Hospital staff interest in such combined experience with cancer will undoubtedly exert a salutary influence on practice in the hospitals. The Tumor Registry is equipped to assist physicians with special studies. At the request of a participating agency, the Tumor Registry will provide information useful to the physician in assembling a series of the agency's cases.

One of the more important features of the Tumor Registry program is the possibility which it provides for evaluating the cancer control program. Of critical significance in this evaluation is the extent to which diagnoses are microscopically confirmed as recorded in medical records from year to year. Table 6 and Chart 2 indicate that 70.6 per cent of the diagnoses in this series were so confirmed.

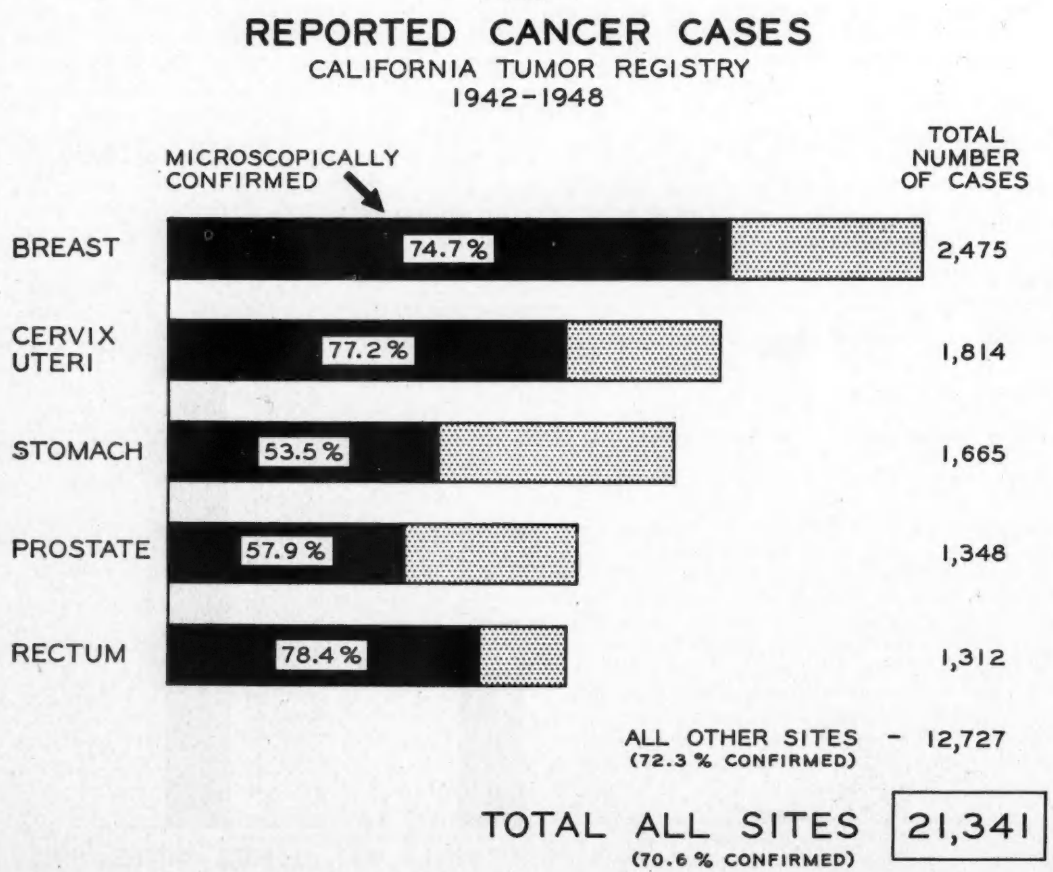
An important factor in determining the results of cancer treatment is the period of delay between onset of symptoms and the initiation of treatment. Part of this delay is due to the patient's failure, for

TABLE 6.—*California Tumor Registry, 1942-1948: Reported Cancer Cases, Selected Sites, Per Cent Microscopically Confirmed.*

Selected Sites	Number of Cancer Cases	Microscopically Confirmed Number	Microscopically Confirmed Per Cent
All sites	21,341	15,059*	70.6
Rectum	1,312	1,028	78.4
Cervix uteri	1,814	1,310	77.2
Breast	2,475	1,849	74.7
Prostate	1,348	780	57.9
Stomach	1,665	890	53.5
All other sites	12,727	9,202	72.3

*Represents all reported types of malignant neoplasm.

CHART 2



a variety of reasons, to seek medical treatment. The rest of the delay represents the lag between the time of first visit to physician and the time of treatment. This time lag can be reduced through efforts on the part of the physician. He may use intensive efforts to impress the patient with the need for prompt treatment and may assist the patient in making arrangements for such care.

In only a little more than half of the series of 11,502 cases was information recorded which could be used in estimating the delay. Table 7 and Chart 3 reveal that in only 36.2 per cent of these cases had the patients visited a physician by the end of two months after onset of symptoms. Then there was an average of a further six weeks' delay before treatment was begun. Among the cases for which information is available, only 80.5 per cent of patients had consulted a physician by the end of 12 months after onset of symptoms. And it should be noted that these data on delay periods, since they are based upon cases in which the patients were hospitalized, put the most favorable light on the situation. A shorter period of delay would be one important measure of the success of cancer education methods.

Progress in cancer control must ultimately be measured in terms of the decline in cancer incidence. Substantial progress toward this goal will depend on greater etiologic knowledge and with it knowledge as to how the occurrence of cancer can be prevented.

At present the major efforts in cancer control are directed toward early detection, early diagnosis and adequate treatment. These efforts are best measured by the survival rate of patients with diagnosed cancer. It is customary to express the survival rate as the percentage of patients alive five years after diagnosis. The mortality rate is highest during the first few years after diagnosis.

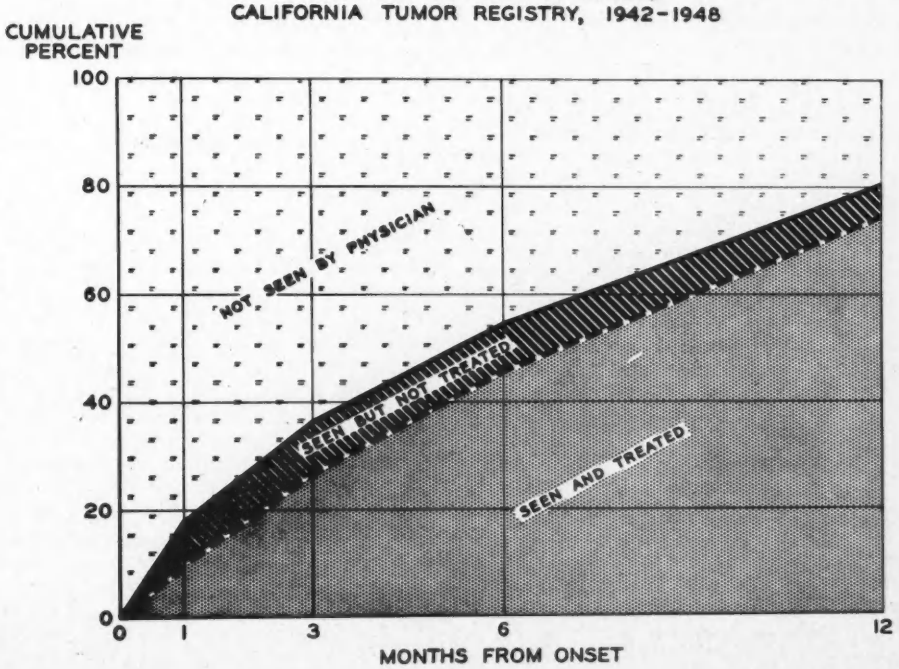
In using such percentages (for example, 20 per cent survival for five years following diagnosis),

TABLE 7.—*California Tumor Registry, 1942-1948: Delay Time of Reported Cancer Cases from Onset of Symptoms to First Physician Visit and to Treatment—Cumulative Percentages.*

		Months from Onset				
		Less Than	1-2	3-5	6-11	12 Mos.
Interval	Total	1 Mo.	Mos.	Mos.	Mos.	and Over
Onset symptoms to first physician visit	100.0 (6,484)	18.0	36.2	54.4	80.5	100.0
Onset symptoms to treatment....	100.0 (6,319)	10.0	26.7	45.5	74.4	100.0

CHART 3

DELAY TIME OF REPORTED CANCER CASES
ONSET OF SYMPTOMS TO FIRST PHYSICIAN VISIT AND TO TREATMENT
(MICROSCOPICALLY CONFIRMED)
CALIFORNIA TUMOR REGISTRY, 1942-1948



the implied comparison is with 100 per cent survival. This comparison is misleading because no consideration is given to deaths due to causes other than cancer, although such causes are a particularly important factor in the age groups most severely affected by cancer.

A better, although still not exact, measure of relative survival rates is to contrast the life span of patients after diagnosis of cancer with the life expectancy for a general group of persons in comparable age brackets (see Chart 4). Even this, of course, is not a precise contrast, since the life expectancy for the general population group is affected to some extent by deaths due to cancer among persons in that group. For precise measurement of the difference between survival rates for persons with cancer and those without cancer, it would be necessary to eliminate the effect of deaths due to cancer from the life expectancy computations for the general population group. The success of cancer control efforts then could be measured by the extent to which the survival rate for patients with cancer could be brought into line with the life expectancy for a comparable general population group without cancer.

The continuous lines in Chart 4 indicate the survival rate of patients with microscopically confirmed cancer, as determined from data of four hospitals (including one large county hospital) which reported a total of 564 cases in the age group 50 to 64 during the years 1942-1944 with sufficient information for calculation of survival. The broken lines represent life expectancy of persons in the 55 to 59 age group in California as computed from data compiled in the years 1939-1941.

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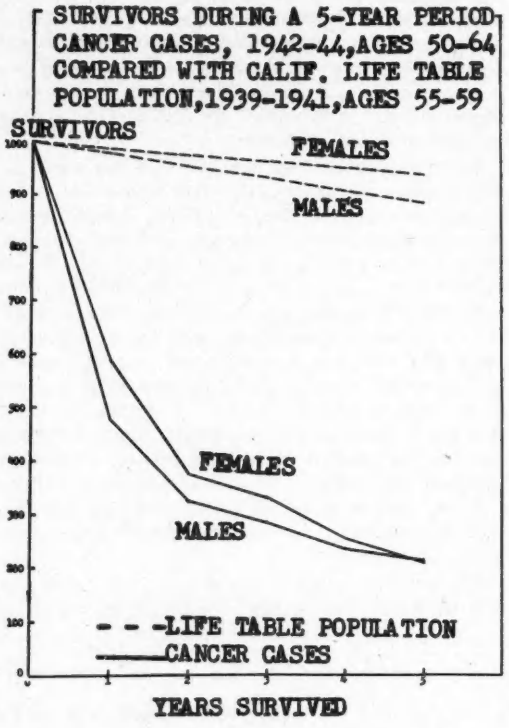
CHART 4



ACKNOWLEDGMENT

Grateful acknowledgement is made to Eschscholtzia Lucia for her assistance in the development of the concept and operations of the registry, to Geraldine Edwards for supervision of processing of the records and assistance in analysis, and to Arthur Weissman for invaluable counsel.

Return of the Vestibular Function Following Streptomycin Toxemia

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SUMMARY

Of 62 patients given 2 gm. of streptomycin daily for an average of 110 days, 42 had complete loss of vestibular response to caloric stimulation. In the great majority of cases, response returned in varying degrees over a period of two years. The incidence of loss of response was higher among patients who weighed less than 125 pounds than among heavier patients, and it was higher among patients over 45 years of age than among those who were younger. Response returned earlier in the younger patients than in the older.

Of 215 patients given 1 gm. of streptomycin for an average of 110 days, 18 had complete loss of vestibular response to stimulation. Sixteen regained response within a year, one in 17 months, and one was lost to study.

THIS report covers the vestibular reactions of 62 patients treated for pulmonary tuberculosis with 2 gm. of streptomycin daily, and 215 patients treated with 1 gm. of streptomycin daily, according to the Veterans Administration protocol.[15] (In 14 of the cases in which the larger dose was used, ulcerative tracheobronchitis was a complicating factor.) That streptomycin may cause defective hearing was not confirmed in investigations by Moffitt[11] and Davis[3] or in the Veterans Administration Streptomycin Conference Report.[13] The only exceptions were cases in which very large doses were given, or in cases of tuberculous meningitis.

All patients in the series here reported upon were examined for vestibular function before, during and after treatment.

Method of Examination: The modified Kobrak test of minimal stimulation was used, rather than the tilt table of Glorig,[5] or the nystagmograph of Linthicum.[9] The examinations were done by one examiner, thus reducing the variables in method and interpretation.

Five cubic centimeters of melted ice was instilled in the ear canal, with the head in a horizontal position, and the liquid was left there until nystagmus was observed with an ophthalmoscope, but not longer than a minute and a half. Nystagmus was considered normal if it started within 50 seconds and lasted from 60 to 90 seconds. The water was emptied out of the ear canal and the head put 60 degrees back, changing the direction of flow of the endolymph in relation to the canal. If the flow was normal, there was rotatory nystagmus.

McNally[10] stated that the whole body musculature is under the influence of the labyrinth and that the eye reactions are actually only a small part of the result of vestibular stimulation.

In the present series, past pointing tests were used to observe the effect of labyrinthine stimulation with regard to the loss or alteration of function in muscle groups other than those of the eyes.[1,6,7] With the head inclined 32 degrees forward and the eyes closed, the patient's arm was held outstretched before him and the index finger placed at a starting point. Then the arm, with the elbow straight, was swung upward until the hand was directly above the head. The patient then was directed to return the index finger to the starting point without bending the elbow. Pointing to the right after stimulation of the right ear and to the left after stimulation of the left ear was considered normal. Return of the index finger to the starting position indicated hypofunction of the labyrinth. If there was no nystagmus and the patient was unable even to approach the starting point in a past pointing test, he was considered to have complete loss of vestibular function.

After all results of stimulation had subsided, the ability to walk naturally on a level hard floor, with the eyes closed, was tested. Pronounced correlation between the amount of vestibular response and the ability to walk on a level hard floor was observed. When the vestibular response was reduced—that is, when there was a shortened duration of nystagmus, absence of rotatory nystagmus or diminished past pointing ability—the patient could take only a few steps with the eyes closed and then would start to fall. When there was no nystagmus or past pointing ability after caloric stimulation of each ear, the patient had difficulty in standing with the eyes closed and total inability to take even one step without falling. It is suggested that this walking test with the eyes closed may be used as a rough determination of the amount of vestibular function remaining.

The most disabling symptoms of streptomycin toxemia have been previously described as vertigo, dizziness and ataxia.[15,13,3,4,5,12] McNally[10] stated that dizziness and vertigo may result from stimula-

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Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

tion, irritation or disease of any of the structures concerned in the maintenance of balance. There may be ocular vertigo, central vertigo or labyrinthine vertigo. Frequently, it is difficult to distinguish between the various causes.

Many patients with a decreased vestibular response have difficulty in walking, with their eyes open, on an inclined surface, on grass, or on a thick carpet and may require the assistance of another person. This difficulty is increased if the light is dim. They also complain of unsteadiness on turning quickly. When they suddenly sit up in bed or stand erect after stooping, the body seems to go too far and does not stop at the vertical position. In streptomycin toxemia there is nystagmus, lack of control of the head and trunk muscles, and difficulty in walking. It would seem, then, that the term "disturbance of equilibrium" would best describe the symptoms due to the neurotoxic effects of streptomycin.

Result of Examinations: All patients hereinafter reported had normal vestibular response in both ears before treatment with streptomycin. Of 62 patients who received 2 gm. of streptomycin daily for an average of 110 days, 89 per cent had a mild decrease in vestibular response at the end of six weeks. Thirty-two had complete loss of vestibular response during treatment, and ten more lost all response within two months after the treatment was discontinued. Of these 42, 14 regained some response during the first year (see Table 1), most of them in succeeding months regaining full normal caloric response with no disturbance of equilibrium.

TABLE 1.—*Data on Loss of Vestibular Response in 62 Patients Given 2 gm. of Streptomycin for 110 days.*

	During Prescription	Two Months After Prescription	Total
Positive*	20	20	20
Negative*	32	10	42

The 42 patients negative after prescription:

	End of First Year	Total Up to Second Year	Total Up to Third Year
Positive	14	26	28
Negative	25	5	3
Lost to study	3	8	8

*The term "positive" indicates no reduction or only partial reduction of vestibular response; "negative" means complete loss of response.

Of the 12 patients who regained some response during the second year, eight had a slight response in both ears and four had a slight response in only one ear after stimulation. All of these 12 were able to take from four to five steps with their eyes closed, walking on a level hard floor.

An interesting observation in these studies was how little vestibular response was necessary to enable patients to walk with their eyes closed, although equilibrium was not normal in every respect. Patients with hypofunction still had difficulty in walking in a dim light, in turning quickly, in riding in an automobile and in stepping down from a curbing, and vision of distant objects was blurred.

Return of Vestibular Function in Weight and Age Groups: The incidence of vestibular damage was higher among patients with body weight less than 125 pounds who received 2 gm. daily than it was among patients who were heavier than that. This conforms with Tompsett's[14] opinion regarding body-weight dosage. There was lower incidence of loss of vestibular response in patients under 45 years of age than in patients in higher age brackets. In the younger group, vestibular response was regained earlier and complete recovery occurred much sooner than in the group over 45 years of age. Many of the older group who had some return of vestibular response still had pronounced disturbance of equilibrium for one or two years, and in a small percentage of these cases there was never a return to normal.

Peik and High[12] reported on 15 cases in which 2 gm. of streptomycin had been given daily. The toxic reactions were similar to those observed in this study. Four patients with moderate to severe loss of vestibular function recovered within seven to eleven months, two others showed slight improvement, one showed no response, all others continued to show serious to severe vestibular loss.

One Gram Dosage: Because of the frequent occurrence of the neurotoxic effect of streptomycin on the vestibular branch of the eighth nerve (which the preceding data show is not necessarily permanent) the Streptomycin Conference[13,15] changed its protocol to use 1 gm. of streptomycin rather than 2 gm. because of the early reports of the lessened toxicity with the use of the smaller dose.

Of 215 patients in the present series who were treated with 1 gm. for an average of 110 days, only 18 completely lost vestibular response to caloric stimulation in both ears. All but two regained some response within the first year. One more regained some response 17 months after discontinuance of the drug and one was lost to study (see Table 2).

TABLE 2.—*Studies of 215 Patients Receiving 1 gm. of Streptomycin for 110 Days*

	After Treatment	End of First Year	End of Second Year
Positive	197	213	214
Negative	18	2	0
Lost to study	....	0	1

The recovery of equilibrium following loss or hypofunction due to the treatment with 1 gm. was much more rapid than recovery after loss of equilibrium under 2 gm. dosage.

As a certain amount of compensation was acquired by patients with hypofunction, walking and turning were a little more steady as time went on. It is probable that this improvement in equilibrium

was due more to gradual return of vestibular function in one or both ears than to the patient's learning to get along without complete labyrinthine control of equilibrium. Bauer[1] stated that the chief factors concerned in the maintenance of equilibrium are vision, the vestibular mechanism, and deep muscle sense, including sensations from the bones, joints and tendons.

Location of Lesion: Winston and Lewey,[16,17] using phospho-tungstic acid and cresylviolet, demonstrated pyknosis and increase of glial fibers around the dendrites of the Purkinje cells in the cerebellum of cats treated with large doses of streptomycin. Jones[6] reported a case of localized encephalitis in which there was no loss of hearing in either ear but complete loss of all vestibular response to both whirling chair and caloric stimulation, ten days before death. In microscopic examination of serial sections of the brain, a localized area of complete degeneration was observed in the center of the tegmentum, extending from the lower part of the medulla oblongata well into the lower part of the pons, with the raphe as its center. It may be concluded that nearly all of the central tracts concerned with vestibular function pass through the area represented by this degeneration, and that few of the fibers of the cochlear system are represented in this region. Fowler,[4] early in the research, reported no abnormal findings at autopsy in sections of the internal ear of patients treated with streptomycin.

Winston and Lewey[17] recently reported that by the vital staining technique, pathologic changes were observed in the cerebellum and medulla in 50 per cent of cats that had been given streptomycin in three divided daily doses. No pathologic changes were detected by this method in cats that had received streptomycin in one daily injection. Of the cats in which pathologic changes were noted, nearly all had lesions in the vestibular portion of the cerebellum; one-third of them changes in the cochlear system, and one-sixth in the vestibular nuclei of the brain stem.

With regard to vertigo caused by certain drugs, Lindsay[8] stated that the occurrence of dizziness and nystagmus in connection with change in the position of the head (which changes the direction of the flow of endolymph) is a fairly reliable indicator of a centrally located lesion.

Berg,[2] on the other hand, concluded that streptomycin primarily affects the sensory epithelium of the labyrinth, and he expressed the belief that the changes in the vestibular ganglion and in Deiters' nucleus presumably are secondary to the primary lesion of the sensory epithelium.

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Prevention of Injury from X-Radiation

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SUMMARY

Despite continued advances in x-ray technology, evidence indicates that x-radiation injuries occur today to an excessive degree. These injuries have led to a progressive stiffening of standards of permissible exposure, especially in the past 15 years.

Protection from radiation damage is logically based on dosimetry, preferably administered by a centralized service laboratory. The experience of two large hospitals in the control of x-radiation exposure is cited.

Personnel exposed to x-radiation may be monitored by either pocket dosimeters of the ion chamber or electroscope type or by standardized film badge dosimeters. A recently developed film badge dosimeter that measures effective x-ray energy and radiation exposure in a quantitative manner is described.

IN this day of universal awareness of the hazards of ionizing radiation, increasing concern over the potentialities of military weapons may tend to diminish respect for less impressive sources of radiation which are now part of the routine environment of the medical and allied professions. While most physicians have become aware of the dangers from overexposure to x-ray and radium, having learned the disastrous consequence of inadequate protection from the experience of pioneers in the science of radiology, it may be well to review the subject of radiation injury and take stock of present attitudes toward protection.

The first instance of severe dermatitis from x-ray was described in July 1896, only a few months after Roentgen's epoch-making discovery. Intensive exposures during the next few years resulted in a harvest of atrophic digits and cancerous lesions of the hands among the early users of x-ray. The total number of medical and technical personnel who have sustained damage from ionizing radiation during the past 60 years can never be accurately determined. However, Parker[12] has recently estimated that physicians and technicians have suffered serious injury at the rate of one casualty for every 30 man-years of exposure. This estimation is admittedly conservative, since he quotes other authorities who accept a rate of one injury for every 20 man-years. Furthermore, knowledge of the consequences of repeated small doses is still meager and will be expanded only as quantitative data become available for analysis.

Although the technical equipment used in radiology has undergone progressive improvement during the course of years, careful studies have shown that even the most modern equipment is inadequately shielded. Radiologists, who are obviously most vitally concerned with protection from ionizing radiation, have also been shown by biostatistical evidence to be inadequately protected. In a study of the life expectancy of physicians, Dublin and Spiegelman[4] showed that the death rate of physicians from leukemia was twice that of the general white male population of comparable age. Subsequently, in a review of statistics on the mortality of medical specialists during the years 1933-1942, they found[5] that medical specialists as a group had a mortality rate of only 71 per cent that of non-specialists. However, according to these investigators, "Roentgenologists, radiologists and dermatologists have a high rate of mortality from cancer and leukemia, far above that for non-specialists. This condition among these specialties suggests strongly the effect of their exposure to dangerous radiations."

Further indication that radiologists are inadequately shielded was offered by Braasch and Nickson[2] in a recent report of a study of the hands of radiologists insofar as skin damage and modification of fingertip ridges are concerned. They found that 48 per cent of radiologists had recognizable abnormalities as compared with 1.8 per cent of an unexposed group of comparable personnel. In the group studied, all radiologists who had had more than 35 years' experience had involvement of the skin of the hands.

THE MAXIMUM PERMISSIBLE DOSE

Soon after the recognition of the damaging effect of uncontrolled exposure to x-ray, an attempt was made to formulate tolerance doses. Rollins[14] made the first formal suggestion in 1902, at which time he advised that radiologists test the amount of radiation by exposure of a photographic plate to sources of radiation. The qualitative test which he suggested was based upon the view that "if a photographic plate is not fogged in seven minutes, the radiation is not of harmful intensity." This exposure was probably equivalent to about 10 to 20 r per day from soft x-radiation, a quantity almost certain to result in disastrous consequences in a relatively short time. Injuries continued to occur and recog-

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nizable damage to the bone marrow, reproductive organs and skin led to the establishment of lower tolerance levels until now there is general agreement as to the quantity of radiation to which it is believed that persons may be exposed during the course of their professional lives without serious injury. The first quantitative value of tolerance dosage was proposed by the International Committee on X-Ray and Radium Protection in 1931.[7] The tolerance suggested was 0.2 r per day, a value generally accepted until 1936, when it was reduced to 0.1 r per day[9] following a proposal by the National Bureau of Standards. Throughout the period of work on atomic energy during World War II the values of 0.1 r and 0.1 rem (roentgen-equivalent-man) per day were accepted as maximum doses for all forms of ionizing radiation. Experimental work on animals at various Manhattan Project agencies contributed to the knowledge of tolerance radiation, and this work is continuing under the auspices of the Atomic Energy Commission.

In December 1949 the Atomic Energy Commission[1] further reduced the permissible exposure limit to a level which is now accepted by the National Bureau of Standards and many other governmental agencies concerned with health protection. These new limits provide that "the total exposure of any part of any person's body to all types of radiation shall not exceed 0.30 roentgen-equivalent-man (rem) in any one week." The rem unit is used rather than the roentgen, since it applies to other types of radiation than x-ray and represents an attempt to evaluate relative hazard of the various rays and particles. Physical equivalents (rep*) of 0.30 rem are shown in Table 1.

LEGAL STATUS OF MAXIMUM PERMISSIBLE RADIATION DOSES

Although standards of maximum allowable exposure have been proposed by the National Bureau of Standards,[10] the Atomic Energy Commission,[1] and numerous official industrial hygiene agencies, it must be pointed out that there is no single legal standard which is mandatory throughout the United States. Under individual governmental jurisdiction, health or safety units may have established standards of their own or accepted those of the Atomic Energy Commission or of the National Bureau of Standards. However, only those institutions or laboratories using Atomic Energy Commission isotopes or working on commission-sponsored projects are responsible to the commission for maintenance of the AEC standards.

In commenting upon the early American Advisory Committee on X-Ray and Radium Protection proposals, Taylor[15] indicated the lack of legal compulsion, but stressed the possible effectiveness of accepted tolerances in the following statement: ". . . the question of the legal status of these recommendations has been frequently raised. They have none. The Committee feels that none is needed; that legislative enactment tends to stunt development and prevent healthy changes. We are free to admit that our present proposals may require changes in the future as they are developed. We wish nothing to interfere with the freedom for modification. It should be pointed out, however, that lack of legal standing will probably not in any way detract from their legal value. They are a recognized set of recommendations, drawn up by qualified representatives of the art and freely distributed to those interested. A court decision involving x-ray protection would in all probability, for lack of another source, be guided by these recommendations, and persons ignoring them may be held liable for negligence." While it is true that the principal purpose of permissible dosage level is to establish limits which preclude any possibility of harm to persons habitually exposed, the legal significance of these standards has been demonstrated by numerous litigations involving the question of injury from radiation. The measuring stick in all such cases is the accepted tolerance level at the time of exposure.

During the past few years radiation standards have achieved a legal status in many state and local jurisdictions. Industrial safety codes have included tolerances to radiation among the tables of maximum allowable concentrations for industrial hazards in general. The values proposed have as much application to physician employers as to industrial users of x-ray, according to codes now in force in many parts of the United States. An example of legal tolerance levels is described in the following discussion of the new general industrial safety orders of the state of California.

CALIFORNIA INDUSTRIAL SAFETY ORDERS

In January 1950 the State of California adopted a new set of general industrial safety orders intended to "make full provision for securing safety in places of employment."[3] Included among the orders is Article 53, which establishes minimum standards applicable to all employments and places of employment in California for protection against radiation and radioactivity. The new Bureau of Standards tolerance dose of 0.3 rem per week is considered applicable to all except "totally protective installations," defined as those resulting in a "dosage rate at any accessible point outside the enclosure not greater than 6.25 milliroentgens or milliroentgen-equivalent-physical per hour when the radiation pro-

*The unit "roentgen equivalent physical" refers to that quantity of ionizing radiation which is capable of producing 1.615×10^{12} ion pairs per gram of tissue or that will cause an absorption in tissue of 83 ergs per gram. One roentgen of X or gamma radiation produces an equivalent ionization in one gram of air under standard conditions.

TABLE 1.—*Physical Equivalents (rep) of 0.30 Roentgen-Equivalent-Man*

Type of Radiation	r/week	rem/week	rep/week
X-ray	0.3	0.3	0.3
Gamma	0.3	0.3	0.3
Beta	....	0.3	0.3
Fast neutrons	....	0.3	0.1
Slow neutrons	....	0.3	0.1
Alpha	....	0.3	0.03

ducing equipment is adjusted to give the maximum dosage rate at the point in question under operating conditions." It is specified that "no medical installation, either diagnostic or therapeutic, is considered totally protective" in the terms of this definition. Equipment which may be considered "totally protective" is found only in industrial radiographic installations for metallurgical or other testing purposes which are shielded or isolated in such a manner as to produce the low dosage rate specified. Obviously, medical apparatus used in radiographic rooms cannot be isolated in similar fashion.

In order to assure the protection of operatives, Paragraph 3804(c) indicates the requirements for monitoring of x-ray installations. "Inspections required by (a) and (b)* shall be carried out by means of appropriate monitoring devices suitable for detection of such radiation as may be encountered; and shall be made by a person competent to make such inspections. Records of such inspections shall be reviewed by the supervisor and shall be filed as a permanent record available to representatives of the Division" (i.e., the Division of Industrial Safety). The personnel monitoring requirements are further elaborated by paragraph (d): "Employees who, regularly or frequently, may be subjected to ionizing radiation which potentially could exceed the exposures referred to in Paragraph 3803 shall wear appropriate indicating or monitoring devices to show the amount of ionizing radiation to which such employees have been subjected. Records of exposure as recorded by these devices shall be reviewed by the supervisor or other competent person and shall be filed as a permanent record available to representatives of the Division."

"(Exceptions: Employees in medical services, either diagnostic or therapeutic, shall wear appropriate indicating or monitoring devices at intervals prescribed by the physician responsible, at least annually. The records shall be made available to representatives of the Division.)"

MONITORING METHODS FOR PROTECTION OF PERSONNEL

The purpose of monitoring is to measure the radiation exposure accumulated during the work week. At present photographic films or pocket electroscopes, or both, are widely used. The present-day accepted levels of tolerances make the use of quantitative methods mandatory. The old technique of carrying a dental film with a paper clip in the roentgenologist's pocket may still be useful, especially if film density is calibrated to the exposure conditions, but mere estimation of darkening of the exposed film is no longer considered a sufficiently reliable index of dosage. Tierney and Deglow[16] have described the method of pocket dosimetry currently in use in many radiation laboratories, and have made a good case for use of the electroscope. However, the use of pocket dosimeters of the minometer or Landszerk electroscope type requires expensive auxiliary equipment and this method of measurement is frequently inaccurate. Discharge of the ionization chambers may result from changes in climatic conditions or physical jarring of the instrument. Although there is some advantage in the opportunity for daily readings, the technique is cumbersome since even moderate accuracy requires that all personnel be provided with two dosimeters and the responsibility for maintenance of safe conditions is usually inadequately centralized.

In certain circumstances, as pointed out by Newell,[11] pocket dosimeters are highly advantageous. They are generally less energy-dependent than most film badges, and in contradistinction to the exposed films which require processing before reading, the dosimeters can be read from moment to moment. "Their real usefulness comes in situations where the worker knows that he is running an unusual risk of exposure and wants to reassure himself all through the operation that he is still performing it in a safe manner."[11]

FILM BADGE METHOD

Film badge techniques, properly standardized, are generally more satisfactory for continuous monitoring of personnel. This method has been adopted by all of the radiation projects under the Atomic Energy Commission and by most large teaching hospitals and other institutions in which there is exposure to x-ray and radioactive isotopes. One of the disadvantages inherent in most film badge techniques, however, is the fact that the standards for densitometry must be established for each radiation source. That is to say, the darkening produced by varying energy levels is not dependent upon the total dosage as measured in roengens. To overcome this difficulty, Tochilin, Davis and Clifford[17] devised a step shield for film badge dosimetry which offers a quantitative method of measuring x-radiation exposure independently of the energy of the source. By means of step ratios, this method determines the quality of incident x-radiation which strikes the dosimeter film. The metal step shield has an open window and three different metal absorbers, as a consequence of which the darkening of the film is of variable degree in the four quadrants of the film, and measurement by photoelectric densitometry affords a means of determining the quality of the x-rays as well as the dose. Since film blackening in the x-ray region is dependent upon the quality of x-rays, a relation is established which allows the roentgen dose to be estimated quantitatively from the varying degrees of blackening in the four regions. Film developing techniques have been standardized for a wide latitude of conditions and for different x-ray developers.

Properly calibrated film badge dosimeters routinely worn and used over various portions of the body in order to determine areas of possible exposure are probably the most reliable safeguard at present available to the roentgenologist or his assistants. Even when pocket dosimeters are worn in pairs (to make certain that high readings are not due to

*Paragraph 3804 (a) and (b) state the accepted tolerances.

accidental discharge of one of the instruments), there is reason to believe that their accuracy is frequently substandard. Roberson, Deal and Day,[13] in a study of the response of one widely used pocket chamber, found variations greater than 50 per cent when compared to standard ionization chambers exposed in the same x-ray region. While this apparently large discrepancy is not critical in the measurement of tolerance doses, the range of error indicates that the use of commercially available pocket dosimeters does not insure precise measurement of the radiation received by the wearer.

Those concerned with monitoring of personnel exposed to beta and gamma radiation are in general agreement about the reliability of film badge dosimetry. Pocket ionization chambers and electroscopes are often used as adjuncts, but seldom as the only or principal methods of radiation measurement. When they are used, the lowest reading of the pair should be accepted as the probably correct value. However, even this reading should not be accepted unless confirmed by film badge dosimetry. An indication of overexposure requires an immediate investigation of the working conditions, and corrective measures if hazardous operation is confirmed.

If the greatest possible information is to be derived from film badge dosimeters, they must be used according to standardized techniques of film development and interpretation by which accuracy may be maintained. In general, hospitals and industry do not have the equipment necessary for adequate control of dosimetry of x-ray installations unless they operate large-scale facilities. Even if they had the necessary control equipment, there is some question as to whether they should undertake this protective service themselves, for the following reasons:

1. Central agencies properly equipped to serve radiologists and other users of radiation may best establish rigidly standardized techniques.

2. Objective data obtained by an independent agency will have a favorable status in the event of medicolegal action.

3. Agencies concerned principally with monitoring may be more readily supervised by official agencies such as the Division of Industrial Safety and others concerned with protection of personnel.

Many large hospitals have provided their employees with radiation monitoring services. The department of radiology at the Massachusetts General Hospital[15] has recently reported that personnel have shown progressively lower exposure since the institution of film badge dosimetry. This technique has now provided something really effective in comparison with the previous advice for regular blood examinations, which admittedly do not discover the results of excessive radiation until damage has already been done. A similar service has also been started at the University of California Medical Center for all personnel engaged in radiological work. At the outset it was discovered that overexposure was not infrequent. One person is said to have received a dosage of 5 roentgens in a single week.[8] Institution of corrective measures has resulted in limitation of exposures to well below the tolerance level.

While many large institutions have recognized the need for personnel protective measures, little has been accomplished among the vast number of smaller institutions and physicians' offices where radiographic and fluoroscopic equipment is in use. The new general industry safety orders of the state of California constitute a recognition of the need for extension of protective services to all users of x-ray. However, the purpose of the orders can be implemented only by provision of monitoring services available to physicians, dentists and x-ray laboratories as well as large hospitals.

CONCLUSIONS

Recognition of the danger of exposure to ionizing radiation has led to a series of recommended dosage tolerances, the levels of which have gradually diminished as knowledge of harmful effects of radiation has increased.

A maximum allowable exposure of 0.3 r per week (or equivalent dosage by alpha, beta, proton or neutron rays) is now accepted by the Atomic Energy Commission, the National Bureau of Standards, and the Division of Industrial Safety of the State of California.

Personnel exposed to radiation may be monitored by either pocket dosimeters of the ion chamber or electroscope type, by means of properly standardized film badge dosimeters, or by both methods.

Film badge dosimeters, of the type permitting quantitative measurement of x-radiation exposure, provide the most suitable means for continuous monitoring of exposed personnel.

Centralization of dosimetry techniques has special advantages in assurance of accuracy and provision of objective evidence in the event of litigation.

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Therapeutic Perspective

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SUMMARY

Unless proper perspective is maintained in medical therapeutics, a physician in his earnest desire to cure disease may often use measures which may ultimately cause more damage than the disease being treated.

In order to avoid loss of perspective, it is necessary to balance the known consequences of the disease against the expected benefits of the treatment minus the known hazards of the treatment.

"Perspective: A view including distance as well as foreground, hence, a far-reaching mental view, in which things appear in proper relation to each other."

IN medical therapeutics, "perspective" means considering the long-term consequences of treatment as well as immediate results; and seeing things in their proper relation to each other implies that the methods used in treatment must not be more dangerous to the patient than the condition for which treatment is given. Hippocrates more than 2,300 years ago expressed the idea thus: "The ideal of the true physician is to do good, or at least to do no harm."[1]

In looking over the history of medical therapy, numerous instances may be noted in which perspective was lost, and in which the treatments employed resulted in more harm to the patient than would have been done by the untreated disease. (And this with the treatment carried out in "proper fashion." The authors are not here concerned with misuse of therapeutic measures, but consider strictly the *inherent qualities* of a given method, correctly applied.)

The purpose of this paper is to point out certain examples of loss of therapeutic perspective, and to suggest a simple formula to be kept in mind when deciding on selection of therapeutic procedures.

When certain essential facts are known, it is not difficult to maintain proper perspective. These data in general terms include:

1. Known consequences of the disease
2. Expected benefits of the treatment
3. Known hazards of the treatment

Under ideal conditions, the factors are known on a statistical basis, and decisions are made with relative ease. For example:[2]

a. Outcome of untreated syphilis—25 per cent mortality rate.

b. Expected benefits of arsenical treatment—95 per cent survival.

c. Mortality rate from adequate arsenical treatment—0.3 per cent.

Hence, net gain with arsenical treatment (25 less 5.3)—19.7 per cent.

Unfortunately, corresponding data are not available on most diseases and drugs and other agents used in treatment of them. On the other hand, in dermatology there are relatively few diseases in which the questions of death, or even serious disabling consequences, come into consideration, and for this very reason, choice of therapy must be made with the greatest of care. For example, in the treatment of plantar warts:

a. Outcome of untreated disease, in terms of serious consequences—zero.

b. Expected benefits of treatment with roentgen radiation—no better than many other potentially less dangerous treatments.

c. Known hazards of roentgen therapy in currently recommended doses — possible radiodermatitis, carcinoma (and death in some instances).

In these circumstances, roentgen treatment in dosage recommended at present is obviously to be condemned.

A few examples of apparent loss of therapeutic perspective:

1. A three-month-old baby girl had eczema of the lower abdomen and vulva, the eruption having been present six weeks. She had been treated previously by two certified dermatologists, both of whom had given x-ray treatment to the vulva and the lower abdomen.

Questions:

a. Does anyone know how much radiation at 80 to 100 kv reaches the ovaries through the abdominal wall of a three-month-old infant, and what the effects are on the ovary?

b. Is x-ray so indispensable in the treatment of eczema that risks such as this must be taken?

c. Are the *known* possible consequences of the disease as serious as the *known* possible consequences of therapy?

2. An eight-year-old girl was observed at a meeting. The diagnosis was eczema and very questionable lupus erythematosus. The latter diagnosis was so questionable that all dermatologists present, except the physician presenting the case, felt that lupus erythematosus was not to be seriously considered. Included in the treatment the patient received were

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eight weekly intramuscular injections, 5,000 units each, of theelin.

Questions:

a. Did the physician know exactly what this amount of estrogen might do to the patient in relation to growth and effect on pituitary-gonadal function?

b. Does theelin have particular proven value in lupus erythematosus?

c. Even if it had great known value, would it be justified in the face of very questionable evidence for diagnosis of lupus erythematosus?

3. For many years, so-called Vincent's infection of the gingiva was treated by many physicians with arsenobenzols, such as neoarsphenamine, given intravenously. The known mortality from Vincent's angina is zero. Many instances of hemorrhagic encephalitis and death have occurred following one to three injections of neoarsphenamine and are reported in the literature, including deaths in cases of Vincent's treated with one to three injections of neoarsphenamine. In spite of this, Vincent's gingivitis was treated with intravenous arsphenamines until penicillin became available.

4. In a case presented at a dermatological society meeting, the diagnosis was granuloma annulare. The treatment given was 50,000 units of calciferol thrice daily for several weeks.

Questions:

a. Are the possible consequences of granuloma annulare as serious as the possible consequences of large doses of calciferol?

b. Is such treatment justified, even if calciferol were a specific treatment (which it is not) for granuloma annulare?

5. A 22-year-old college girl had three circular areas of atrophy, telangiectasia, and beginning keratoses on the fingers of the right hand. Each area was sharply marginated. One measured 1 cm. in diameter, the others 0.7 cm. These were the sites of warts which had been treated with x-ray (two exposures to each lesion) by a certified specialist two years previously. There is no reason to doubt that the treatment was carried out properly as defined in modern textbooks, and it is of interest to note that no area was greater than 1 cm. in diameter. There seems little doubt that the consequences of treatment in this case were more dangerous to the patient than the disease for which she received treatment. (The authors' records of the last three years contain seven such cases, involving fingers or plantar surfaces, in all of which treatment had been given by certified radiologists and dermatologists.)

6. Radiation therapy of strawberry nevus over the elbow or wrist or any other radiosensitive anlage, in persons who have not reached full physical development. The amount of radiation used in treating strawberry nevus in many instances is more than enough to interfere with the development of ossification centers and to cause failure of normal development of the limb or organ. Such cases have already been reported.[3, 5] A large vascular nevus over a joint is not as serious as a non-functioning joint.

Loss of perspective is often the result of the physician's sincere and intense desire to help the patient; all physicians must frequently find themselves in such a position. The only purpose of this presentation is to respectfully urge that the idea of therapeutic perspective be kept constantly in mind.

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Thalassemia (Mediterranean Disease) Occurring in Filipinos and Chinese

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SUMMARY

Five cases of thalassemia minor in persons of Filipino and Chinese extraction were observed.

The occurrence of biliary calculi in two of the patients suggests that this may be a relatively common complication of thalassemia as it is of other hemolytic diseases.

THE purpose of this communication is to report the occurrence of thalassemia minor in three Chinese and two Filipinos. Thalassemia (Mediterranean disease, target cell anemia) was originally considered to occur exclusively in persons of Mediterranean origin, particularly those of Sicilian, Italian, Syrian, Greek and Armenian descent. However, the condition has been diagnosed in persons of Jewish,[7] Spanish,[5] Argentine,[1] and Negro origin.[9] Chinese with this condition have been observed,[2, 3, 4, 10, 12] and recently two young Filipino brothers were reported as possibly having the disease, although all the usual diagnostic criteria were not recorded.[11] In a search of the medical literature no other reports of this disease in the Filipino race were found.

GENETICS

Thalassemia occurs in two distinct forms. The first, thalassemia major (classical Cooley's anemia), has prominent clinical features and the prognosis is poor; the second, thalassemia minor, has relatively insignificant clinical features and the prognosis is good. An intermediate group consisting of the milder forms of thalassemia major and the severer forms of thalassemia minor is also recognized. It has been postulated that thalassemia major may be due to homozygosity for a factor which, in a heterozygous person, results in thalassemia minor.[13] Thus, the major form of the disease occurs when both parents transmit the trait, and the minor form when one parent transmits it.[12]

LABORATORY FINDINGS

The characteristic laboratory findings in thalassemia minor are: (1) Hypochromic, microcytic anemia as determined by the Wintrobe indices, (2) morphologic changes far in excess of the degree of anemia, with the occurrence in the peripheral blood of target cells, hypochromic macrocytes, ovalocytes, and occasional stippled cells, (3) increased resistance of erythrocytes to hypotonic saline solution, and (4) occasionally, elevated serum bilirubin, increased fecal urobilinogen excretion and reticulocytosis as evidence of a hemolytic process.

The most typical finding in the peripheral blood is the presence of abnormally thin cells, the leptocytes. These may take the form of cells wide in diameter with only a thin rim of hemoglobin (the so-called hypochromic macrocytes[12]), or they may contain a central area of hemoglobin in addition to the peripheral rim, in which instance they are called "target cells." Target cells occur in approximately 50 per cent of the cases, and occasionally, hypochromia is the only abnormality noted. The number of erythrocytes may vary greatly from time to time in the same patient and frequently reaches polycythemic levels, but the packed volume of the red cells remains relatively constant and is usually below normal. Even with polycythemia, the average hemoglobin content and concentration in the erythrocytes are low, in keeping with the characteristic hypochromia.

MANAGEMENT

The management of patients with thalassemia minor is conservative, for the great majority of persons with this disorder have no symptoms referable to it. Iron, liver extract and the other common antianemia preparations are of no value, and transfusion therapy should be avoided, for, as a result of multiple transfusions, hemosiderosis and perhaps a hemochromatosis-like state may occur.[6, 8, 14]

COMMENT

Table 1 contains the pertinent data obtained in the studies of five patients with thalassemia minor. Patients 1 and 2 said they were of pure Filipino extraction, and patients 4 and 5 were said to be of pure Chinese extraction. Patient 3 stated that one of his parents might have Mexican blood, but that otherwise he is of pure Chinese ancestry. None had symptoms which might be an expression of anemia, and in each patient the disorder was discovered accidentally during the course of hospitalization for unrelated disease. In two instances biliary calculi were encountered. This complication, common in other familial hemolytic diseases, is not mentioned in the literature as a common finding in thalassemia minor. It is possible that the presence of biliary

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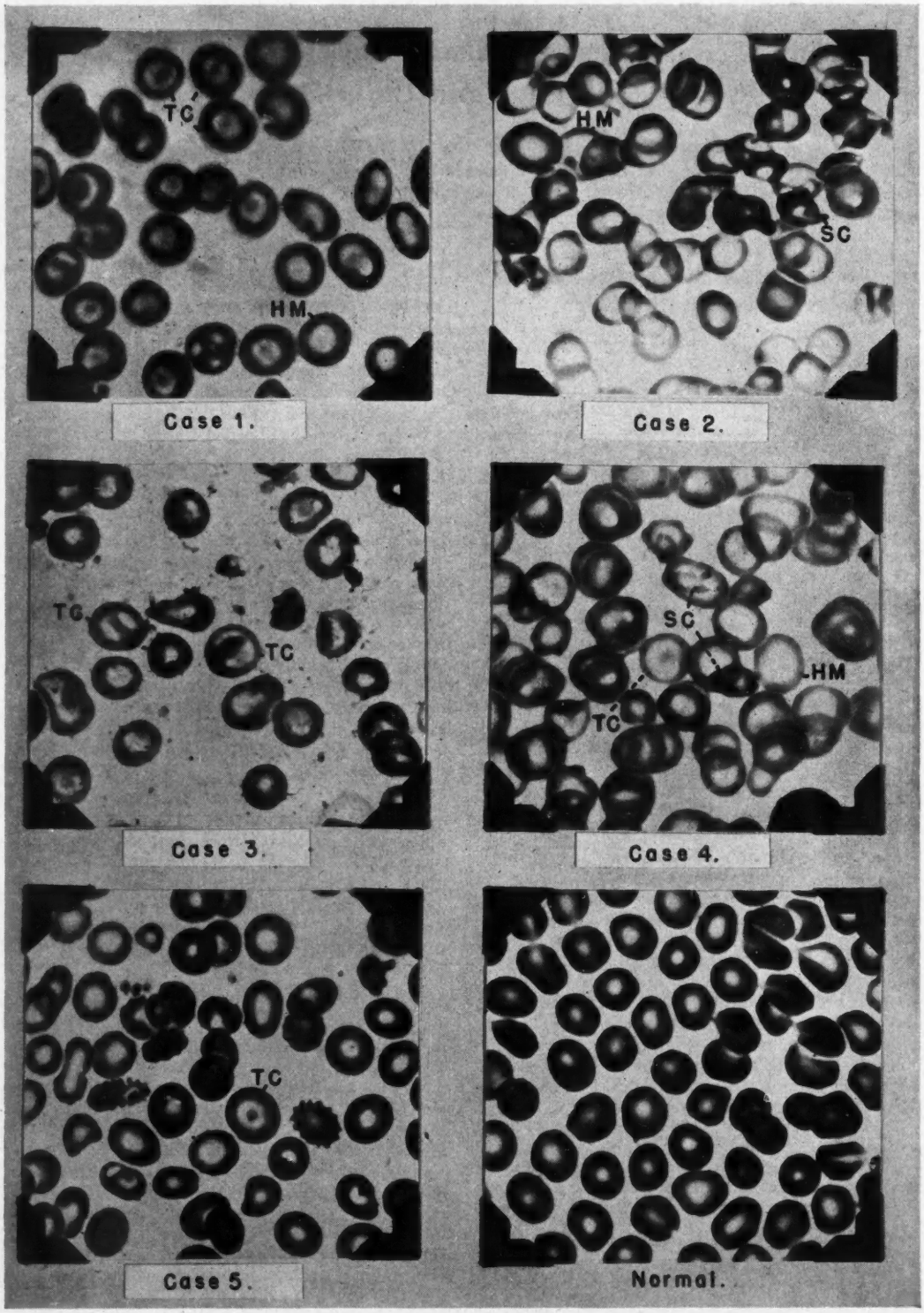

Fig. 1. Peripheral blood smears of patients in this report (x 1164). A normal blood smear is included for comparison. Note the pronounced morphological changes, target cells (T.C.), hypochromic macrocytes (H.M.) and stippled cells (S.C.).

TABLE 1.—*Pertinent Laboratory and Clinical Data in Five Cases of Thalassemia Minor*

	Normal Values	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Race		Filipino	Filipino	Chinese	Chinese	Chinese
Age		36 yr.	40 yr.	35 yr.	35 yr.	8 mo.
Sex		Male	Male	Male	Male	Female
Hemoglobin (gm. per 100 cc.)	14.5	12.0	10.5	10.5	11.5	11.0
Erythrocytes (million per cu. mm.)	5.0	5.9	5.2	5.8	6.9	5.7
Mean corpuscular volume (cubic microns)	82-92	79	73	74	78	.....
Mean corpuscular hemoglobin (micro micrograms)	27-31	21	20	18	19	.....
Mean corpuscular hemoglobin concentration	32-36%	27%	27%	26%	24%	.....
Blood Smear (Fig. 1)						
Target cells	*See	+++	++	++++	++++	+
Poikilocytosis	foot-	+	+++	++	++	+
Anisocytosis	note	++	+++	++	+++	++
Stippling		0	+++	++	++	0
Reticulocytes (%)	0.5-2.0	2.3	2.2	1.8	3.4	.....
Fragility (range of concentration required for hemolysis)	±0.45 to ±0.32	Patient 0.46 0.14 / Control 0.46 0.30	Patient 0.38 0.16 / Control 0.44 0.32	Patient 0.42 0.14 / Control 0.46 0.32	Patient 0.50 0.14 / Control 0.48 0.32	Patient 0.42 0.18 / Control 0.46 0.30
Serum Bilirubin	Below					
1 min. (mg. per 100 cc.)	0.4	0.24	0.08	0.1	0.11	.....
30 min. (mg. per 100 cc.)	0.7	0.10	0.92	0.45	0.79	.....
Fecal urobilinogen excretion (mg. in 24 hr.)	40-280	74	224	95	327	.....

Remarks:

Patient 1: No hepato- or splenomegaly.
Patient 2: No hepato- or splenomegaly.
Patient 3: Biliary calculi, 1945-47. No hepato- or splenomegaly. ? Mexican ancestry.
Patient 4: Biliary calculi, 1942. No hepatomegaly. Spleen palpable 3 finger breadths below left costal margin. Father of Patient 5.
Patient 5: Daughter of Patient 4. Mother is normal.

*In order to estimate the peripheral blood findings quantitatively, the following system was used: Target cells and cells showing poikilocytosis and anisocytosis were counted along the periphery of the blood smear where the total number of erythrocytes per oil immersion field (O.I.F.) varied between 140 and 160. The concentration of these cells was graded as follows: 1+ = 1 to 5 cells per O.I.F.; 2+ = 6 to 10 cells per O.I.F.; 3+ = 11 to 20 cells per O.I.F.; 4+ = more than 20 cells per O.I.F. The number of stippled cells was graded as follows: 1+ = .025 per cent to .1 per cent per O.I.F.; 2+ = .1 per cent to .5 per cent per O.I.F.; 3+ = .5 per cent to 1 per cent per O.I.F.; 4+ = 1 per cent to 5 per cent per O.I.F.

calculi in two patients was coincidental, but it seems more likely that this complication was the result of the hemolytic process characteristic of thalassemia.

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Irradiation Treatment of Lymphoid Hyperplasia of the Nasopharynx

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SUMMARY

Irradiation is useful in the destruction of hypertrophied lymphoid tissue which cannot be surgically removed.

Beta, gamma and roentgen rays have been used for this purpose. With beta rays, surface tissue must be subjected to relatively high dosages if effective radiation is to be delivered to deeper-lying tissues. This disparity is less when gamma rays are used, less still in the case of x-rays.

With the possibilities of permanent damage considered, choice of method depends upon the location and extent of the excess lymphoid tissue to be destroyed and the mechanical difficulties of reaching it with effective irradiation without hazard to intervening or surrounding tissue.

IN the past ten years irradiation of the nasopharynx has become a widely used method of reducing excess lymphoid tissue. Lederer[7] pointed out that the method was used to a great extent during the 1920's but then in most places was abandoned. Surgical removal of excess nasopharyngeal lymphoid tissue has been done for years. However, it is often impossible to remove all of the lymphoid tissue at operation, especially that lying around the orifice of the eustachian tube and that in the fossa of Rosenmuller. Also, sometimes there is regrowth of lymphoid tissue following operative removal. It was for the purpose of removing this excess lymphoid tissue after operation that irradiation methods were developed, and irradiation has been used successfully for this purpose for almost 30 years. Originally x-rays and gamma rays were used. Crowe[9] and his associates have used radon or beta irradiation for many years. During World War II Crowe helped design a beta radium applicator in order to permit treatment of more patients than was possible with the radon applicator because of the deterioration factor.

Irradiation of the nasopharynx is used in cases of impaired hearing and of chronic upper respiratory infection. Crowe and his associates have done a large amount of work in this field and are probably responsible for the widespread use of the monel radium applicator. They have expressed the belief that obstruction of the orifice of the eustachian tube by hypertrophied lymphoid tissue is an underlying factor in many cases of impaired hearing and that, if the condition is not relieved, permanent damage may result.

There are considerable differences among the various types of irradiation. The beta radium applicator, which is the most recent innovation, does not have as high an output as the radon applicator due to the filtration by the radium salt in the plaque.

Table 1 shows the roentgen equivalent delivered at various depths by the 50 mg. beta radium monel applicator. These data were presented by Braestrup[1] at the 1949 meeting of the Academy of Otorhinolaryngologists. Since that time, measurements have been made on other 50 mg. nasopharyngeal radium monel applicators similar in construction to the one used in Braestrup's study. Variations in the dosage rate, at the surface, between individual applicators were of the order of 15 per cent. It will be noted that the surface in contact with the applicator receives an extremely large dose, while 5 mm. away only one-sixteenth of the surface dose is delivered and at 10 mm. one seventy-fourth is delivered. Crowe[3] pointed out that the erythema dose delivered by the radium applicator in the nasopharynx is not the same as the erythema dose delivered to a flat surface, such as the skin, where an erythema dose is ordinarily determined. The contour of the nasopharynx is irregular and only half of the length of the applicator touches the mucous membrane. The points at which the applicator does touch the surface must receive intense irradiation.

TABLE 1.—*Roentgen Equivalents Delivered by Beta Radium Monel Applicator*

Depth mm.	Equivalent Roentgens for— 1 min.	12 min.	36 min.
Surface	370	4,450	13,300
0.5	225	2,700	8,100
1	168	2,020	6,050
2	96	1,152	3,460
3	58	696	2,088
4	36	432	1,296
5	23	276	830
10	5	60	180
20	1.3	14.4	43

Bilchick and Kolar[2] observed some redness and edema following 12-minute exposure with the beta

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applicator. They believe that the reason they have noted reactions in a greater percentage of cases than have other investigators is that they are very careful to shrink the turbinates before inserting the applicator so that it may be pushed well over to the lateral side of the nasopharynx. Bilchick and Kolar observed that the highest intensity of reaction occurred between the 11th and the 13th day. (Their observation corresponds with the author's experience.) Because of these reactions, they have shortened the exposure time to nine minutes and increased the interval between treatments to three weeks.

Table 2 shows the amount of radiation reaching different depths when using gamma rays, that is, a 50 mg. applicator with 0.5 mm. platinum filtration. This method of treatment is not as widely used as the beta ray, probably because it is necessary to treat the patient for approximately one hour at each sitting. From Tables 1 and 2 it is evident that with the beta applicator a very large amount of radiation is delivered at 1 mm. depth while only 2 per cent of this amount reaches a depth of 10 mm., whereas if gamma rays are used, 17 per cent of the amount delivered at 1 mm. reaches a depth of 10 mm.

TABLE 2.—*Radiation at Various Depths When Using Gamma Rays*[10]
(50 mg. Radium Applicator with 0.5 mm. Platinum Filter)

Depth	Equivalent Roentgens for 30 min. = 25 mg. hr.	Equivalent Roentgens for 60 min. = 50 mg. hr.
1 mm.	1,125	2,250
1 cm.	200	400
2 cm.	50	100
3 cm.	22	45

Table 3 is a depth dose chart of two different voltages of x-ray. With x-ray the distribution of the irradiation is more homogeneous and the intensity on the surface is low when an adequate amount is delivered to the midline in the nasopharynx.

Figure 1 is an x-ray film showing a dummy beta radium applicator in place in the nasopharynx. The handle of the applicator was taped to the opposite side of the face in an attempt to force the radium against the lateral nasopharyngeal wall. After the location of the applicator in the midline was noted in this film, the applicator was placed in the same way in three other cases and x-ray films were made from the same position. In only one case of the four in which this method was used was the applicator successfully placed against the lateral pharyngeal wall. No attempt was made to shrink the turbinates, which perhaps was the reason for failure to place the radium in the proper position.

Figure 2 is an x-ray film taken with the dummy applicator in place and a silver catheter barely within the mouth of the eustachian tube. Care was taken not to extend the cannula up the tube. The radium-containing portion of the applicator is about

Figure 1.—Beta radium applicator in place in nasopharynx.

Figure 2.—Applicator in place and silver catheter barely within the mouth of the eustachian tube.

TABLE 3.—*Tissue Dose in Roentgens Corresponding to a Free Air Dose of 100 r at 50 cm. Focus Skin Distance.*

KVP	Filter	Area	Depth in Centimeters 0	1	3	5	7	10
140	0.25 mm. cu.	100 sq. cm.	138	134	109	81	61	39
200	0.5 mm. cu.	100 sq. cm.	136	133	109	82	63	31

1 cm. from the tip of the catheter which is barely within the orifice of the eustachian tube.

When the different types of irradiation are examined, it is apparent that for a very small amount of lymphoid tissue immediately surrounding the orifice of the eustachian tube the radium applicator would be the most desirable if it could be properly placed. Whether a filter of 0.3 mm. monel metal or one of 0.5 mm. platinum is better should be considered. If it were desirable to penetrate more than 2 or 3 mm., the platinum filter would be the more efficient. As the proponents of beta radiation state that the applicator is in actual contact with only half of the tissue to be treated, it would seem desirable to filter out the intense beta radiation. If that were done, the length of time for the application of radium would have to be greatly increased in order to deliver an effective dose.

If there is more than a very limited area of hypertrophied lymphoid tissue, other means than the present beta ray applicator would seem desirable. Morrison[8] described a new type of applicator with a flexible shaft designed so that the active radium-containing portion can be steered to the desired site. However, it would seem that considerable time might be needed to get the tip of the shaft in the proper position, and it would be difficult to be certain that the radium remained in the exact position desired. Also, if a large area were treated, the dose would be very irregular on the surface.

X-RAY IRRADIATION

The other means of irradiation is x-ray. This would seem to be the most logical if an area of more than 2 or 3 mm. away from the applicator is to be treated. There are two methods of application. One is to direct the ray through the side of the face in such a way as to cross-fire the nasopharynx. When this is done, the x-ray passes through the parotid gland and occasionally produces parotitis and usually some dryness of the mouth. These are temporary results and are not considered serious by most radiologists; no permanent damage to the parotid gland has been reported. The danger of damaging the growing mandible also has been considered. While such damage has been observed as a result of x-radiation of the mandible for tumor, only a small dosage is used for destruction of excess lymphoid tissue and no evidence of any damage to the bone has been reported.

The other method of applying x-radiation, and one which is advocated by Kerr,[6] is to put the cone into the patient's mouth and aim at the nasopharynx. Some radiologists use two fields, one to each side of the nasopharynx, while others use a single field to include both sides. Intraoral irradiation is very satisfactory if a large enough cone can be placed in the mouth and if the patient will hold his mouth and head in the proper position. When this approach is used, no x-ray reaches the parotid gland.

So far as the author has been able to determine, there are no reports of permanent damage in the nasopharynx following irradiation with the beta ray applicator. However, many radiologists feel that in cases in which the beta ray applicator is used there is a possibility that changes will occur later in life in the posterior nasopharyngeal wall because of the intense radiation to which that area is subjected in the course of treatment. When three applications of 12 minutes each are given at two-week intervals, a very large amount of radiation (13,300 r) is applied to the surface. Even though the entire applicator does not touch the surface, the points it does touch receive as much radiation as would be necessary to destroy a malignant lesion; and it is questionable that it is wise to submit the mucous membrane to such large dosage when there are methods of irradiating the lymphoid tissue which do not entail such intense radiation on the surface.

In choosing the kind of irradiation to be used, it is desirable to have accurate knowledge of the amount and location of the lymphoid tissue present. This information can best be supplied by an otolaryngologist who is skilled in the use of a nasopharyngoscope or a nasopharyngeal mirror. A lateral roentgenogram of the nasopharynx is of aid in determining the thickness of the lymphoid tissue on the posterior pharyngeal wall. It is considered advisable to remove the adenoid tissue surgically before irradiation is attempted. Fowler[4] advised operative removal of the adenoid tissue in the midline as this tissue prevents placement of the radium applicator in the proper position. A thorough examination of the hearing acuity should always be done by an otolaryngologist before radiologic treatment for impaired hearing is undertaken.

Recently there has been some difference of opinion as to the results obtained by irradiation. Guild's[5] conclusions on hearing acuity following irradiation differ from those of Crowe.[9] Guild expressed the opinion that accepted beliefs with regard to the effect of nasopharyngeal lymphoid tissue on hearing and with regard to the effectiveness of nasopharyngeal irradiation in treatment of impaired hearing need to be revised.

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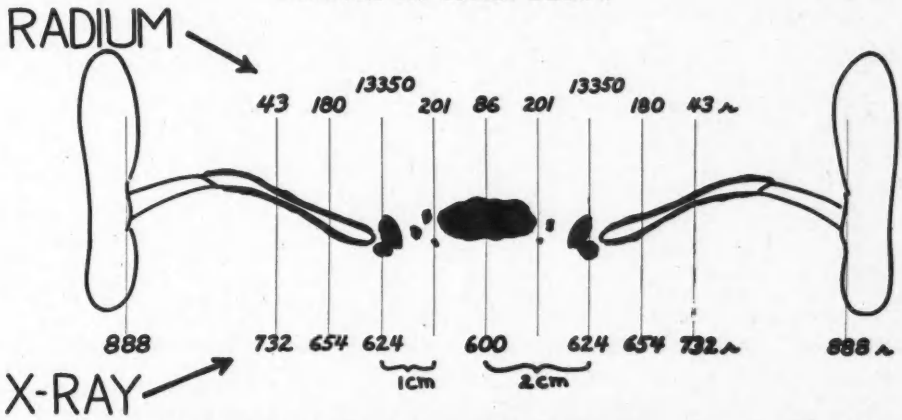
Discussion by SYDNEY F. THOMAS, M.D., *Palo Alto*

Graphic representation of the dosage levels from the monel filter type of radium applicator for the nasopharynx is recommended as they appeared in the exhibit of Drs. M. E. Mottram, H. A. Hill and L. H. Garland (see chart).

Technical difficulties in the measurement of beta rays have been one of the most difficult stumbling blocks in the assaying of the dosage of radiation from these monel-filtered radium applicators (beta applicators). And we now have the knowledge that the dosage, as it can be measured, is extremely high, as pointed out by Dr. Irwin in the substance of his paper.

The failure of many physicians to take cognizance of very small changes in distances radically affecting the dosage of radium is pointed out, and it is no wonder that cases are reported showing radiation ulcerations from too high a dosage for a benign disease. It is pointed out in the paper that this is above a cancerocidal dose.

COMPARATIVE DOSES FROM X-RAY AND RADIUM—FULL COURSE—
FACTORS AS GIVEN BELOW*



NOTE HOMOGENEOUS IRRADIATION OBTAINED WITH X-RAYS AND UNEVEN DOSAGE WITH RADIUM (EXCESSIVE AT ORIFICES)

*Factors:

X-ray: H.V.L. 1.0 mm. Cu. 50 sq. cm. field. 40 cm. F.S.D. 100 r in air to each side X6.

Radium: Standard monel metal applicators with 50 mg. radium at each orifice. Three treatments of 12 minutes each.

CASE REPORTS

- Schwannoma of the Stomach
- Skin Granuloma Following Laceration by a Fluorescent Lamp
- Treatment of Diabetes Mellitus with Propylthiouracil
- Amnesia for Limbs—Diagnostic Value of Syndrome

Schwannoma of the Stomach

GEORGE E. CHAPPELL, M.D., CARLETON C. WRIGHT, M.D., and LEWIS E. NOLAN, M.D., *Sacramento*

ASKANAZY is believed to be the first to describe an isolated neurofibroma of the stomach. More recently sporadic reports have appeared describing occasional cases and in 1948 West and Knox published experience with six cases of neurofibroma of the stomach and included a report of one case each of neurogenic sarcoma and leiomyoma. Their report did not state the incidence these six cases represented, but from the chronological aspect (1932-1948) it is considerably more than it was previously believed to be.

Statistics from the large surgical centers of this country and individual reviews of the literature generally agree that of all neoplasms involving the stomach, about 0.5 per cent to 2 per cent are of benign nature; and of the benign tumors of the stomach, about 5 to 10 per cent are neurofibromas. There have been several reports claiming a much higher incidence, but those reports included postmortem findings of benign tumors of the stomach which were asymptomatic during life and probably would have remained so had the patient lived. They were purely coincidental findings.

The reasons for considering a pathological entity which occurs so infrequently are, as enumerated by Kiefer: (1) the severity of the resulting symptoms; (2) the uniformly successful outcome with proper treatment, and (3) the possibility that malignant change may occur.

A classification of benign tumors of the stomach on an anatomical basis has been proposed by Carli. He enumerated four types: (1) those arising from the mucosal elements, such as polyps and adenomas, (2) those arising in the areolar tissues of the submucosal layer, such as lipomas, fibromas, angiomas, etc., (3) those that arise from the muscle layer and which constitute by far the greatest number of benign tumors, the leiomyomas, and (4) tumors originating in nerve elements of the stomach. This classification may serve to keep the possibilities of benign stomach tumors in mind, and for the sake of completeness, a fifth classification might be added—ectopic pancreatic tissue.

For some time there has been controversy over the pathological details of neurofibromas. It is generally agreed that they arise from the nerve sheath, but the exact component of the sheath is a controversial subject. Verocay, Masson, Stout, Willius and Laird have expressed belief that they originate in the ectodermally derived sheath of Schwann, and consequently they have used the term schwannoma for these tumors. Penfield held that the mesodermally derived epineurium or perineurium is the site of origin and he used the words neurofibroma and perineural fibroblastoma to describe the lesions. The term neurinoma, meaning nerve fiber tumor, which was introduced in 1910 by Verocay, seems inappropriate. Regardless of the nomenclature, the tumors in question usually are composed of fibrous tissue cells primarily and contain varying amounts of fragmental nerve fibers which require special stains to demonstrate. The nuclei of the fibrous tissue cells frequently are arranged in vertical rows, giving rise to the so-called "palisade" formation or regimentation which is the characteristic structural feature of neurofibroma.

In some cases this palisade formation is absent or is present only to a small degree, the nerve elements are more prominent and myxomatous changes are present in varying degree. Such tumors are thought to be more liable to undergo malignant degeneration.

The neurilemma or Schwann's sheath is a nonelastic, delicate membrane composed of cells that, like the links of a chain, enclose the axis cylinder throughout its length. The Schwann cells are of ectodermal origin and arise chiefly from the embryonic cells of Schwann or Lenhossek's lemmoblasts of the neural crest. The peripheral nerves are composed of fascicles of nerve fibers held together by connective tissue divided into endoneurium, epineurium and perineurium. Thus the neurofibroma may be derived from the sheath of Schwann or the neurilemma, or from the connective tissue of endoneurium, epineurium or perineurium, or from a mixture of the two elements. Tumors that are made up principally of Schwann cells are best termed schwannomas or neurilemmomas.

Grossly, the schwannoma is well circumscribed and, on cut section, stands out sharply from the surrounding tissue. Most such tumors are round or oval, pinkish-gray, of uniform texture and of soft to moderately firm consistency. Microscopically observed, they are described as fasciculated, reticular and epithelioid, with the three patterns not always sharply separated.

The nerve elements of the stomach are composed of the fibers of the vagus and the sympathetic nerves and the intrinsic plexuses of Auerbach (subserous) and Meissner (submucous). It is not known whether neurofibroma of the stomach shows any predilection for one or the other of the groups of nerves. Peripheral neurofibromas seldom affect the motor or sensory functions of the nerves involved, and judging by the low incidence of physiologic disturbance it would appear that the same is true of neurofibromas in the stomach.

The symptoms of neurofibroma of the stomach are due to mechanical effects. The most common symptom is hemorrhage, which may be severe. It usually begins without additional symptoms and is associated with clinical signs of exsanguination. Pallor, weakness, fainting, and tarry stools may be noted, all without simultaneous abdominal pain. Obstruction due to a ball valve action of the tumor dropping through the pylorus has also been described. In addition to these mechanical difficulties, in most cases there is history of vague anorexia, loss of weight and abdominal fullness for some time prior to the onset of more definite symptoms.

X-ray examination or gastroscopy usually is necessary to establish the diagnosis, but suspicion should be aroused by

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a history of massive hemorrhage occurring on several occasions over a long period of time with no progression to cachexia or appearance of other diagnostic symptoms and signs. In most cases a filling defect can be observed in roentgen studies, and the benign nature of the tumor is suggested by the lack of induration of the wall of the stomach adjacent to the base of the tumor and by the fact that there is normal motility in the stomach wall up to the edge of the tumor-involved area.

The radiological findings in the case of schwannoma of the stomach observed by the authors and reported herein were similar, if not identical, to those associated with other benign tumors. There is no true diagnostic or differentiating point. The benign tumors, in general, appear as a well-defined sessile or pedunculated, rounded mass projecting into the lumen of the stomach. They may be as small as a small polyp or papilloma or so large as to fill the entire gastric lumen. Usually there is no disturbance in gastric motility and no invasion of the stomach wall. However, at times, the size and position of the tumor may be such as to cause partial pyloric obstruction. In the case of the larger tumors, an ulcer crater is frequently present at the apex of the mass. Perier, in a report of three cases of schwannoma of the stomach, described roentgenologic findings the same as those noted in the case reported herein, but added that similar findings may also be present in connection with leiomyomas. It is impossible to determine precisely the kind of lesion on the basis of roentgen evidence.

As benign tumors of the stomach may undergo malignant degeneration which is not at first detectable radiologically, operative intervention may not safely be delayed. The treatment, once the distressing symptoms are controlled, is excision. This may be a localized procedure, or, if there is question of malignant change, more radical stomach resection.

CASE REPORT

A 61-year-old white male entered the hospital Dec. 4, 1949, with complaint of tarry stools and weakness and fainting for three days. The body weight of the patient had decreased by 35 pounds in the preceding five years, but anorexia was not noted. Except for pallor, no abnormalities were observed in physical examination. The blood pressure was 100 mm. of mercury systolic and 50 mm. diastolic and the pulse rate was 120 per minute. The patient was treated supportively and several blood transfusions were given. When sufficient recovery had occurred, roentgen studies of the stomach were carried out. A large, intraluminal mass arising from the mid-portion of the lesser curvature was observed. The radiologic diagnosis was leiomyoma with ulceration of the tumor mass. Diverticulum of the duodenum was also noted. Results of gastric analysis were within normal limits of acidity. Seventeen days after the patient was admitted, the growth was removed en bloc by subtotal resection.

The resected segment of stomach was annular, 16 cm. at the greatest diameter. The stomach wall contained a submucosal and circumscribed, gray, rather soft nodule 3 cm. in diameter. A covering of ulcerated mucosa was observed in microscopic examination of a section of the tumor mass which lay in the mid-portion of the greater curvature of the stomach on the anterior side. The ulcer was covered with granulation tissue which rested on the large nodule in the stomach wall. The mucosa at the ulcer margin was of normal appearance. The tumor mass was made up of elongated cellular fibers with pronounced palisading and regimentation of the nuclei. The nuclei were elongated with tapering ends, had vesicular chromatin patterns, and approximated each other in size. There was a clear zone of cytoplasm at both poles of the cells. In the space between the regimented nuclei there was a loose arrangement of connective tissue cells with round, oval and elongated nuclei. The tissue was cellular throughout, but no malignant changes were observed. The pathologic diagnosis was neurilemmoma (schwannoma of the stomach), with chronic ulcer over the neurilemmoma.

The patient recovered and was discharbed on the eighth postoperative day.

SUMMARY

A case of schwannoma of the stomach with overlying gastric ulcers is reported. The tumor was removed by subtotal resection and the patient recovered.

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Skin Granuloma Following Laceration by a Fluorescent Lamp

Report of a Case

COOPER DAVIS, M.D., and ORVILLE F. GRIMES, M.D.
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SKIN lesions associated with exposure to beryllium compounds have been described mainly in conjunction with reports of pulmonary lesions found in industrial workers exposed to these compounds.[5, 12] Recent descriptions of subcutaneous granulomas at the sites of skin lacerations with fluorescent lamp fragments carry the problem, in some measure, from the industrial plant into the office and home. Seven such cases have been reported.[1, 6, 9, 10] Although the use of beryllium silicate, the offending substance, is presumably being discontinued by most manufacturers, the lamps in current use and in stock will present a danger for some time to come.[12]

CASE REPORT

In September 1948 a white 7-year-old boy received a single laceration approximately 1 cm. in length over the dorsal aspect of the proximal interphalangeal joint of the left middle finger from a broken fluorescent lamp. Treatment consisted of mercurochrome, applied at the time of injury; boric soaks, advised one week later when mild cellulitis was observed; and, when a moderate painless swelling occurred, a five-day period of penicillin therapy, warm compresses and bed rest. In spite of active treatment the lacerated area became progressively indurated, and by December 1948 a thickened, reddish, slightly tender granulomatous lesion had developed which intermittently exuded small amounts of thin, clear fluid (Figure 1).

Intradermal tuberculin and coccidioidin tests (each 1:1000) elicited negative reactions. The blood serum gave a negative

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reaction to the Kolmer test and to agglutination tests for typhoid, paratyphoid A and B, tularemia and brucellosis. In a radiologic examination no evidence of foreign body or bone destruction in the finger was noted; there was some suggestion of effusion in the proximal interphalangeal joint space. A roentgen film of the chest was normal.

In a biopsy specimen from the lesion in February 1949 portions of tuberculoid granulomas infiltrated with chronic inflammatory cells were observed. A few foreign body giant cells were noted, one of which contained a small triangular crystalline body. Nonhemolytic Staphylococcus albus and diphtheroid bacilli were grown on cultures of the biopsy material. In tests for acid-fast organisms, including guinea pig inoculation, tubercle bacilli were not demonstrated. In March 1949 the patient received a series of x-ray treatments to the involved finger (450 r in air).

When the patient was admitted to the University of California Hospital in April 1949 the fibrous granuloma measured 2 by 3 cm. and there was a 0.5 cm. patch of ulceration in the central portion of it. The area was not particularly tender and there was full range of motion of the proximal interphalangeal joint.

Spectrographic studies of the urine for beryllium content were not done. Radiologic studies of the finger again showed no evidence of foreign body, bone destruction or joint involvement. The soft tissue swelling was noted to be somewhat larger than on the previous examination.

The lesion was excised, including a 1 cm. margin beyond its indurated borders. The dissection was carried down to the extensor tendon, where it was apparent that the joint capsule was elevated and somewhat tense. The capsule was incised, allowing the escape of a small amount of clear fluid. A small mass of tissue, grossly resembling that of the choroid plexus, extended into the joint space and was excised. After closure of the capsule, the resultant defect on the dorsum of the finger was covered by a full thickness skin graft procured from the lateral anterior abdominal wall.

In microscopic study of the specimen (Figure 2) numbers of small tuberculoid granulomas were noted, each consisting of clusters of epithelioid cells lying in a fibrous stroma. In many of the tubercles there were central areas of hyalin-like necrosis. No giant cells or acid-fast organisms were noted. No glass particles were discovered in the specimen. A pathologic diagnosis of chronic granuloma of the finger, compatible with beryllium granuloma, was made.

Specimens of tissue and fluid removed from within the joint were tested for bacterial content by cultures and guinea pig inoculation but no organisms were demonstrated.

A portion of the specimen was examined spectrographically by a method described by Cholak and Hubbard.[2] No beryllium was found. (It should be noted that Cholak and Hubbard indicated that the lower limit of detectability by this method is 0.25 micrograms.) It was assumed that a smaller, undetermined amount of beryllium was present in the excised lesion.

The postoperative course was uneventful. The skin graft has healed satisfactorily. Although the joint area remained somewhat enlarged, there was normal, painless range of motion (Figure 3). In later x-ray studies of the finger no evidence of bone erosion or destruction was observed.

SUMMARY

A skin granuloma occurred at the site of laceration of a finger with a fluorescent lamp fragment. Because of certain characteristics noted in specimens examined microscopically, beryllium granuloma was diagnosed (although it could not be confirmed spectrographically) when results of tests to demonstrate other etiologic factors were negative. The treatment was wide excision of the lesion. In subsequent x-ray studies there was no evidence of involvement of the bone.

Figure 1.—The central ulceration was surrounded by an indurated, swollen, chronically inflamed area.

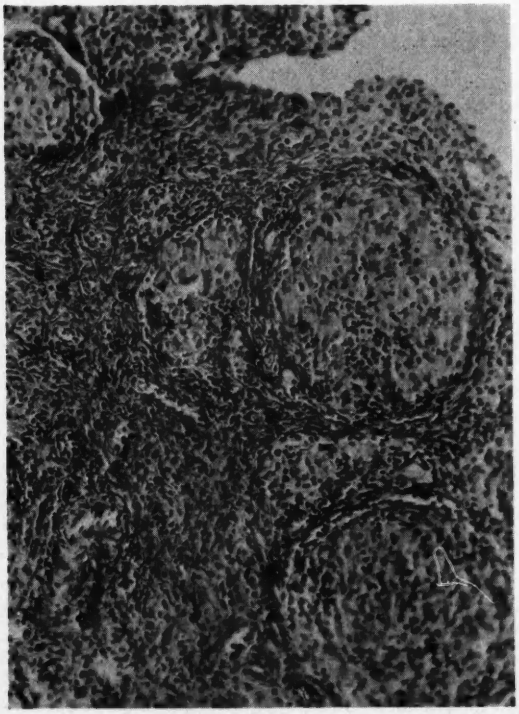

Figure 2.—The epithelioid cells form small granulomas which are strikingly similar to those found in tuberculous lesions.

Figure 3.—The postoperative photograph illustrates the size of the skin graft necessary to close the wound. Wide surgical excision of the beryllium granuloma is mandatory.

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Treatment of Diabetes Insipidus with Propylthiouracil

Report of a Case

EDWARD KAYE, M.D., *Newman*

THE work of Mahoney and Sheehan[1] showing the abolition of experimentally produced polyuria and polydipsia in dogs by total thyroidectomy and the reestablishment of the symptoms following orally administered desiccated whole thyroid gland, suggested the use of a thyroid-inhibiting drug, propylthiouracil, in the treatment of this syndrome.

CASE REPORT

A white woman, 48 years old, who for two years had had severe headaches frequently accompanied by nausea and vomiting, had been admitted several times to the hospital with a diagnosis of migraine. These attacks responded more or less well to the usual therapeutic measures, and the patient was able to leave the hospital after three or four days on each occasion. Quite abruptly insatiable thirst developed and the patient urinated as often as every 15 minutes. Upon physical examination no abnormality was noted. The 24-hour volume of urine was in excess of 4,000 cc. and the specific gravity was very low. Treatment with Pitressin® tannate in oil relieved the polyuria and polydipsia for from 18 to 36 hours. The 24-hour output fell to less than 1,800 cc., and the specific gravity rose to more normal levels. Each dose of Pitressin® or Pituitrin,® which also was given, was followed by headaches, nausea and vomiting.

Propylthiouracil was given in a dose of 150 mg. daily. After three days the patient had no headache, nausea, vomiting, thirst, or frequency of urination. With no other medication than propylthiouracil the patient was symptom-free for 12 weeks except for two brief periods in which the drug was omitted and polyuria and polydipsia promptly recurred. While taking propylthiouracil the patient urinated only once every five or six hours; the specific gravity of the urine was greater than 1.015, and the 24-hour output was less than 1,800 cc.

Propylthiouracil was discontinued after five months, and at last report six weeks later there had been no recurrence of polyuria or polydipsia.

SUMMARY

Polyuria and polydipsia developed suddenly in a patient who had been hospitalized several times with severe headaches, nausea and vomiting. Temporary remission of the polyuria and thirst was obtained with Pitressin,® but each dose was followed by headache and nausea.

Propylthiouracil, 150 mg. daily, was given, and after three days all symptoms abated. With no other medication the patient was symptom-free for the next 12 weeks save for two brief periods when the drug was omitted and polyuria and polydipsia promptly recurred. The drug was finally discontinued after five months; and the patient, when last observed six weeks later, had had no recurrence of excessive urination or thirst.

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Amnesia for Limbs

Diagnostic Value of Syndrome

J. M. NIELSEN, M.D., *Los Angeles*

AMNESIA for the limbs of one side of the body is a symptom often encountered by those who treat cases of cerebral vascular lesions and tumors. The syndrome was known even before the turn of the century but did not come into general recognition in this country until about 1935. The amnesia may be episodic or constant, and it may be so severe that the patient has a delusion that the limbs are absent.

When the patient has amnesia for his limbs (usually the minor ones) he simply acts as though they were not there. He uses the leg for walking, usually deviating toward the affected limb, without stopping to think it strange that he can walk, but he does not pick anything up with the left hand and does not raise it when asked to raise his hands. He may allow the forgotten limb to hang over the side of the bed or he may awaken at night with what he considers the limb of another person across him.

In cases previously reported several striking manifestations have been encountered. A dentist bathed and dried the right side of the body and did not touch the left side until his wife called his attention to the fact. He then finished the bath but in dressing finished with the left side undressed. A woman was sitting in church when cerebral thrombosis involving the left limbs occurred. She said her left arm seemed to drop off and disappear and she had to examine herself with the right hand to determine that her left was still there. Another woman complained that her dead brother-in-law's arm was across her all the time and that an old rusty foot was in bed with her.

Whether the left side of the body can be reestablished in the patient's memory in time depends at least in part on the patient's psychologic make-up. Persons who are hard-headed factualists insist that the absence of one side is an absurdity and that they merely *feel* as though the left limbs are absent. Those who are gullible readily accept the absence of the limbs as fact. If the patient lives for six months or more after the amnesia develops he usually regains memory for the limbs; the longest period of amnesia for limbs so far observed was five years and in that case the patient died without recovering from the amnesia.

The system in the brain essential to remembering the limbs is the supramarginal cortex, thalamo-supramarginal peduncle of fibers, and the pulvinar of the thalamus. In all of 50 cases so far observed at autopsy the lesion was in the thalamus (pulvinar), in the supramarginal cortex, or between the two. Six cases have been observed in which the lesion was on the left side of the brain and the right limbs were involved. However, in most instances of such lateralization the patient, because of aphasia, cannot state his problem. Three additional cases in which the symptom was valuable in establishing localization of the lesion are herewith reported.

REPORT OF CASES

CASE 1: A woman 42 years of age had a seven-year history of numbness of left limbs with development of Jacksonian seizures without loss of consciousness. There was amnesia for the left hand and partial astereognosis.

The past history was irrelevant except for three accidents. The first was an automobile accident 11 years before in which a knee was cut but there was virtually no injury of the head. The symptoms, however, began after this. In a second automobile accident, seven years previously, the teeth were broken. After this episode the symptoms became lateralized. One year before coming under observation the patient bumped her head on a piece of furniture and afterward had headaches.

After the first accident attacks of numbness of the fingertips of both hands and of the lips developed. The numbness was associated with a severe itch, not actual pain. After the second accident the numbness was lateralized to the left arm and leg and never disappeared entirely. About one year before the patient was examined by the author an attack occurred in which the left leg straightened out and the foot inverted. In that episode the patient fell. The patient described other attacks characterized by weakness, blurring of vision and straightening of the leg. More recently amnesia for the left hand had developed, with the patient occasionally unaware of having the hand or of holding anything in it. Because of this she had dropped things.

No significant abnormalities were noted in a general physical examination. Upon neurological examination, normal sense of smell was noted, but there was loss of interest and attention in homonymous half-fields at all times, with the so-called extinction phenomenon. At other times complete homonymous hemianopia was observed. The pupils were unequal, the left being larger, but reaction to light was good. The fundi of the eyes were normal, and hearing was normal. The hand grips were equally weak. All deep reflexes were increased on the left but Babinski's sign was not elicited. There were hypesthesia to touch in the left hand and a defective stereognosis. At times it was clear that the patient forgot the left limbs; she acted as though they were paralyzed or absent. When objects were placed into the left hand she did not accept them unless her attention was called to them. When asked to pick up anything with the left hand she used the right unless it was restrained.

A neoplasm (meningioma of the petrous ridge) was considered most probable. No lesion was observed in an air encephalogram. The patient's symptoms continued.

CASE 2: A woman 50 years of age complained of periods of automatic behavior and bad memory. The patient had had tonsillectomy, appendectomy, removal of a tumor from the right breast, a rectal operation, and a hysterectomy. In an automobile accident 16 years previously, internal injuries and multiple fractures, including one of the pelvis, had occurred and the patient was unconscious for several days. A year later she was hospitalized and diagnosis of a functional condition was made. The patient was treated at various clinics and lost jobs because of "too much time out." The current diagnosis was hyperinsulinism. The liver "was not supposed to be working right."

The patient's chief complaint, however, was that of doing things without knowing later what she had done. She had transferred from one street car to another and had found herself out on a trip without knowing the purpose of it. She had episodes of smelling horrible odors of which she could not find the source, and she had concluded that the odors followed her about. She also had severe unilateral headaches but also headaches on both sides extending from the eyes back over the head.

Further, there were periods of wakening at night with delusion that the left side of the body was absent. At times, the patient said, she hunted with the right hand for the left and when she located it, it was cold and clammy. She shook it and rubbed it to reestablish life, which seemed to be gone.

No abnormality was observed in a general physical examination. In a neurological examination, anosmia was noted. This the patient explained on the basis of nasal congestion. However, the patient had dysosmia; certain perfumes made her nauseated, and bacon and coffee did not smell as they had earlier in her life. The pupils and eyegrounds were normal. There were no reflex changes, no abnormal reflexes, no loss of sensory perception, and no astereognosis. Consid-

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erable emotional distress had developed "because" of the difficulties described by the patient. A tentative diagnosis of tumor at the base of the brain on the right side, perhaps a meningioma, was made and operation was recommended.

CASE 3: A woman 38 years of age was referred with complaint of a feeling of unsteadiness when walking or standing. Although the patient considered herself to have been well up to three weeks before, inquiry elicited that there had been cacosmia seven months previously. At that time she had episodes of smelling foul odors which followed her about, and at the same time she had pains on the left side (which seemed to have been central in origin). She complained of feeling heavier on the left side; she stated that she was pushing three people ahead of her on that side and had poor use of the left hand. At times there was a sensation described as that of a vibrating machine affecting the left limbs, and the left leg would go to sleep, with soreness and a pin-and-needle sensation in it. The left limbs, the patient said, were cold and purple.

Upon physical examination the blood pressure was 160 mm. of mercury systolic and 104 mm. diastolic, and the pulse rate was 90 per minute. The muscles in general were doughy to palpation as in muscular dystrophy, but the skin was normal. In a neurological examination the sense of smell, fields of vision, and fundi of the eye were noted to be normal. However, the right pupil was 5 mm. and the left 3 mm. in diameter. The other cranial nerves were not affected. Except for absence of the tendoachillis reflexes, all deep reflexes were present and symmetrical although slight. Plantar response was entirely absent, and no pathological reflexes could be elicited. Sensory perception was normal throughout. Psychologically the patient was depressed, felt "beaten" and "heavy," and stated that life was not worth living.

Three weeks later the deep reflexes were absent. The patient did not use her left hand and acted as though it were absent unless she was asked to use it. In walking there was deviation to the left as in hemianopia, which, however, was not present. Bilateral simultaneous stimulation was perceived only on the right side.

COMMENT AND CONCLUSIONS

In three cases of amnesia for limbs, there were olfactory hallucinations in two, central pain in one, focal seizures with automatism in one, and the extinction phenomenon in two. The amnesia for limbs gave positive evidence of presence of the lesion in the thalamoparietal peduncle in each case and thus enabled determination of the anatomical site and also the extent of the lesion. If the symptom of amnesia for limbs is kept in mind, it is not difficult to detect even when the patient himself is unaware of it. As an aid in establishing the location of a cerebral lesion it is a valuable symptom. When the lesion is on the major side the patient usually cannot speak of it because of aphasia.

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EDITORIAL

For Freedom in Medical Education

When the American Medical Association announced in December that it was contributing $500,000 to a fund to aid the country's medical schools, it planted an idea that appears to be taking root rapidly. Almost immediately other contributions began to roll in—unsolicited, voluntarily donated by those who believed sincerely in the cause of freedom of our medical schools.

Before formal plans for collection and allocation of funds for the medical schools were completed, various contributors were reported to have assembled close to $100,000 to add to the initial half million by the A.M.A. Board of Trustees. As an aid to the fund, and as representative of complete support of the idea, the Council of the California Medical Association has voted to contribute $100,000 to this worthy movement. Five of the nation's medical schools are in California. Other state medical associations are understood to be considering appropriations of their own, in line with their financial resources.

Right now the formal machinery for gathering and allocating these funds is in operation. There has been formed an Illinois non-profit corporation known as the American Medical Education Foundation, whose sole purpose will be to aid medical education through supplying necessary funds to needy schools. Sparked by a board of directors representing the highest officials of the American Medical Association in its policy-making, administrative and scientific branches, this foundation is dedicated to "provide unrestricted funds for the use of medical schools in the training of future physicians."

As was pointed out in the January issue of CALIFORNIA MEDICINE, the word "unrestricted" is the key to the entire movement of voluntary contributions to the medical schools. The Federal Government cannot use that word if it contributes tax funds to these schools; under its political and legal inhibitions, it would be bound in part at least to take over the management of the schools, in their curricula, teaching methods, personnel and even students. What rules and regulations would be built up under the existing governmental system of law by regulation rather than by statute, one can only imagine; if the operation of some other Government departments is a criterion, the regulation of medical schools would be carried out in such a way as to capture the institutions as bases for a push for state medicine.

The American Medical Education Foundation offers an opportunity for the physicians of the country to support their own schools and obviate the need for federal funds. Many questions as to details of the fund remain to be answered. However, there is sufficient brain-power on the board of directors to bring forth sound answers to these questions. Given a little time, this board will surely arrive at satisfactory policies to aid our medical schools and to satisfy the desires of those who contribute the funds.

At present the Foundation is aiming at annual contributions of $100 each from the practicing physicians of the country. It is intended to establish local or county committees to supervise and encourage such contributions, which will then be added to the general fund for distribution in an equitable manner. The Foundation is seeking an opinion as to the tax-deduction status of such contributions. While this question has not yet been answered, it is

reasonable to assume that the chances are good that such contributions will be considered deductible; after all, contributions to the parent universities are, by and large, tax-deductible. Regardless of this question, however, the need for immediate action by the medical profession is obvious. The schools need money now, and they will continue to need it from year to year while current economic conditions obtain.

All who have received it recognize that the cost of medical education is considerably greater than the amount students are required to pay for it. Each graduate physician therefore is beholden to the source of the funds, public or private, which make up the deficit. In discharging that obligation, physicians who may elect either to make tax-free unrestricting contribution to medical schools or to pay a considerable share of taxes to provide fettering government subsidies, will have little difficulty in making a choice.

Almost any physician who gives thought to the matter will readily recognize that a moderate contribution to this cause is in his own as well as in his profession's best interest. And the best time to contribute to this cause is now. Contributions now by physicians who think clearly and act promptly will not only help the fund but will serve as a stimulus for others. Details and forwarding forms are printed each week in the front pages of the *Journal* of the American Medical Association. They are there at hand for alert, quick-to-act physicians who wish to protect their profession as a scientific body, free of political domination and eager to advance along scientific lines.

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NOTICES AND REPORTS

C. M. A. 80th Annual Session

Physicians who attend the 80th Annual Session of the California Medical Association in Los Angeles, May 13-16, will have opportunity to hear discussions on recent developments in a wide variety of medical fields, to examine a greater number of new scientific and technical exhibits than ever before, and to select from an extraordinarily full and almost continuous program of medical motion pictures. Time for divertissement has also been provided. In order that members of the House of Delegates might not be called upon to be in two places at once, no scientific meetings are scheduled for the afternoons of Sunday, May 13, and Tuesday, May 15, when the House will be in session.

Now virtually completed, the program includes 174 scientific papers to be presented by California physicians and five eminent out-of-state guests.

GUEST SPEAKERS

The President's guest has not yet been announced, but other guests of the Association and the subjects they will discuss are as follows:

Macdonald Critchley, M.D., F.R.C.P., dean of the Neurological Institute, London—"Observations on Pain," and "Recurring Utterances in Aphasic Patients."

John B. Caffey, M.D., professor of clinical pediatrics, Columbia University College of Physicians and Surgeons, New York—"Some Recently Recognized Bone Lesions in Infants and Children," and "Radiologic Aspects of Chest Diseases in Children."

Herbert D. Maier, M.D., assistant clinical professor of thoracic surgery, Columbia University College of Physicians and Surgeons — "Primary Carcinoma of the Lung," and "Treatment of Tumors of the Esophagus."

Cyrus C. Sturgis, M.D., professor of internal medicine, University of Michigan Medical School—"The Treatment of the Anemias," "Some Recent Advances in Methods of Treating Thyroid Disorders," and "The Nature and Treatment of Leukemia and Allied Conditions."

In addition, the Section on Allergy has invited as its special guest **Frank Perlman,** M.D., clinical associate in medicine at the University of Oregon Medical School and consultant in medicine and allergy at Multnomah County Hospital, whose subject will be "Asthma and Cardiac Dyspnea."

The Section on General Medicine has invited **Marcy Sussman,** M.D., of Phoenix, Arizona, formerly clinical professor of radiology, Columbia University College of Physicians and Surgeons, to take part in a panel discussion following a symposium on "Diseases of the Lung."

Four panel discussions will be held in the course of the Annual Session:

"Diseases of the Lung"—Monday morning.

"Cortisone and ACTH"—Tuesday morning.

"Genito-Urinary Tuberculosis"—Tuesday morning.

"What's New in Pediatrics"—Wednesday morning.

A number of the scientific sections have arranged to have their entire sectional program in a single day, thus giving their members opportunity to attend meetings of other sections if they wish. In several instances two or more sections that have a common interest in a particular subject have made plans for joint meetings.

The Biltmore Theatre, meeting rooms in the Biltmore Hotel, two auditoriums in the Philharmonic Building and the auditorium of the Southern California Edison Building, nearby, will be used for general and sectional meetings. The medical motion picture program will be divided between available rooms in the Biltmore and an auditorium in the California Fruit Growers Exchange Building a block from the hotel.

HOTEL ACCOMMODATIONS

As a large part of the Biltmore Hotel will be given over to the California Medical Association for the four days of the convention, a limited number of accommodations are still available for members of the Association wishing to have rooms there. Requests for reservations should be directed to the C.M.A. office, 450 Sutter Street, San Francisco 8,

California. No deposit for reservations will be required.

It will be particularly important this year that persons attending the annual session register at the C.M.A. registration and information desk which will be located at the rear of the Ball Room. Badges will be given to registrants, and persons who do not have badges will not be admitted to rooms where scientific meetings are being held.

ENTERTAINMENT

A golf tournament will be held at the Wilshire Country Club Tuesday afternoon, May 15. Physicians wishing to enter may register with W. L. Roberts, M.D., Secretary of the Southern California Medical Golf Association, 727 West Seventh Street, Los Angeles. A golf dinner will be held Tuesday evening.

For the President's dinner, Monday night, the California Medical Association has taken over the Biltmore Bowl complete with its orchestra and entertainment.

A "no-host" cocktail party for all members of the Section on Eye, Ear, Nose and Throat, their wives and guests will be held Monday evening—the place and exact time to be announced. On Tuesday evening in Conference Room 2 of the Biltmore, the California Society of Allergy will have a dinner meeting—cocktails at 6:30, dinner at 7:00.

The Pre-Convention Conference of the C.M.A. Cancer Commission will be held in the Biltmore Hotel, Saturday, May 12. There will be morning and afternoon sessions. On the same day the California chapter of the American College of Chest Physicians will present a day-long scientific program at the Ambassador Hotel. Wednesday afternoon, May 16, the California Heart Association will meet and present a program at the Biltmore.

C. M. A.

Annual Preconvention Radiology Conference

Sponsored by the Cancer Commission

BILTMORE HOTEL, LOS ANGELES
SATURDAY, MAY 12
Conference Room 2

Notice to All Radiologists

Those members desiring to present diagnostic or therapeutic cases (biopsy-proven) are requested to communicate immediately with the following:

For THERAPEUTIC CASES:

R. F. Niehaus, M.D. (Chairman), 1831 Fourth Avenue, San Diego.

For DIAGNOSTIC CASES:

M. A. Sisson, M.D. (Secretary), 450 Sutter Street, San Francisco.

Council Meeting Minutes

Tentative Draft: Minutes of the 377th Meeting of the Council of the California Medical Association, Los Angeles, January 27, 1951.

The meeting was called to order by Chairman Shipman in Conference Room 8 of the Biltmore Hotel, Los Angeles, at 9:30 a.m., Saturday, January 27, 1951.

Roll Call:

Present were President Cass, President-Elect MacLean, Speaker Alesen, Vice-Speaker Charnock, Councilors Ball, Crane, Henderson, Dau, Ray, Montgomery, Lum, Pollock, West, Heron, Frees, Thompson, Shipman and Bailey, Secretary Daniels and Editor Wilbur. Absent because of illness, Councilor Green.

A quorum present and acting.

Present by invitation during all or a part of the meeting were Dr. D. H. Murray, legislative chairman; Dr. Wilton L. Halverson, state Director of Public Health; Mr. Howard Hassard, legal counsel; John Hunton, executive secretary; William P. Wheeler, assistant executive secretary; Ed Clancy, field secretary; Ben H. Read, executive secretary of the Public Health League of California; Messrs. Clem Whitaker, Jr., and Ned Burman of public relations counsel; county society executive secretaries Waterson of Alameda-Contra Costa, Gillette of Fresno, Venables of Kern, Cochems of Los Angeles, Tobitt of Orange, Young of San Diego, Wood of San Mateo and Donovan of Santa Clara; and Doctors Conrad Baumgartner, Francis J. Cox, Russell G. Frey, Justin J. Stein, Russel V. Lee, J. Frank Doughty, E. Vincent Askey, J. Lafe Ludwig, Paul Foster, Eugene Hoffman, Clinton Thienes, James N. DeLamater, Charles Carpenter and Mr. William M. Bowman, executive director of California Physicians' Service.

1. *Minutes for Approval:*

(a) On motion duly made and seconded, minutes of the 376th Council meeting, held November 5, 1950, were approved.

(b) On motion duly made and seconded, minutes of the 224th Executive Committee meeting, held November 30, 1950, were approved.

2. *Membership:*

(a) A report of membership as of January 25, 1951, was received and ordered filed.

(b) On nominations duly made and seconded in each instance, eight applicants were elected to Life Membership. These were: J. J. Benton, Alameda-Contra Costa; Axcel E. Anderson, Fresno; Albert G. Bower, Los Angeles; Rex V. Graves and C. C. Violett, Orange County; C. B. Nagelmann and Lindsay Peters, Santa Barbara; Ream S. Leachman, Solano County.

(c) On motions duly made and seconded in each instance, eleven applicants were elected to Retired Membership. These were: Harry E. Foster, Forest C. Kracaw, Clifford Verne Mason and Milton Henry Shutes, Alameda-Contra Costa County; F. X. Ammann, Ralph W. Avery, George B. Greenbaum, Ward Hannah, Meyer H. Newman and Victor E. Stork, Los Angeles County; A. A. Shaghoian, San Mateo County.

(d) On motions duly made and seconded in each instance, seven applicants were elected to Associate Membership.

(e) On motions duly made and seconded, applications for reductions in dues for 13 applicants were voted.

3. *Financial:*

(a) A report of bank balances as of January 25, 1951, was received and ordered filed.

(b) Councilor Pollock suggested that, in view of existing inflationary influences, the Council consider placing some of its investment funds in securities other than U. S. Government obligations. A motion was made and seconded that a portion of investment funds be placed in other types of securities, on advice of investment counsel. A substitute motion, referring this matter to the Auditing Committee for study and report back to the Council, was made, seconded and adopted.

(c) Discussion was held on a resolution forwarded to the Council by the Los Angeles County Medical Association, requesting that the American Medical Association establish a system of collecting its dues direct from its members. On motion duly made and seconded, it was voted to forward this resolution to the A.M.A. for its consideration.

On motion duly made and seconded, it was voted to recommend to the A.M.A. Board of Trustees the consideration of steps to eliminate confusion as between membership and fellowship in the A.M.A.

4. *Public Policy and Legislation:*

Dr. Dwight H. Murray, chairman of the Committee on Public Policy and Legislation, reported that 5,167 bills had been introduced in the 1951 Legislature. Mr. Hassard discussed some of those with a direct bearing on the practice of medicine. The Council directed the Public Policy and Legislative Committee with respect to several bills.

5. *California Physicians' Service:*

Dr. Russell G. Frey, chairman of the C.P.S. Fee Schedule Committee appointed by the Council, reported on the development of a new fee schedule, which was approved by the Trustees of C.P.S. on December 17, 1950. Dr. Frey was complimented on the successful completion of a difficult assignment.

Mr. William Bowman, executive director of C.P.S., distributed and discussed a financial statement, described the new types of contracts being written and stated that when these contracts are in effect in all groups, they should provide between $2,000,000 and $3,000,000 annually in additional funds for payment to physicians. He reported that C.P.S. now has 1,040,000 beneficiary members.

Dr. J. Frank Doughty, president of the Board of Trustees, made a report on the policies of C.P.S. Trustees, particularly in relationship to the requests made by Administrative Members. Dr. Donald Cass, chairman of the C.P.S. Liaison Committee established following the 1950 Annual Session, followed with a report on the meeting of this committee. At the meeting it was decided to recommend the inauguration of the new fee schedule and the establishment of a family gross income of $4,800 annually as the service ceiling. Considerable discussion was held on these recommendations and it was moved and seconded that these changes be not put into effect on April 1, 1951, but should await the discussion of the 1951 House of Delegates. On vote, this motion was lost.

6. *Medical Research:*

Doctors Thienes, Carpenter and DeLamater discussed the proposed legislation developed by the Southern California Society for Medical Research to require that custodial animal shelters deliver unclaimed animals scheduled for destruction to licensed laboratories or teaching institutions. They decried the fact that the Association's legislative representatives had introduced in the 1951 Legislature a bill of a different type. Mr. Hassard, on request, discussed the differences in the approach of the two proposed measures and reported that the C.M.A. bill was similar to bills introduced by the Association for a number of years on the subject of humane pound legislation and licensure of laboratories or teaching institutions using animals.

On motion duly made and seconded, it was voted to approve the activities of the Association's legislative representatives on the subject of humane pound legislation.

7. *Committee on Industrial Accident Commission:*

Dr. Francis J. Cox, chairman of the Committee on Industrial Accident Commission, reviewed the work of his committee and requested that an appropriation of between $10,000 and $25,000 be made to permit the employment of experts to work toward the development of a schedule of fees based upon actual economic conditions and not, as at present, on the results of collective bargaining. Dr. H. Gordon MacLean reported on a meeting held by a special committee appointed by the Executive Commit-

tee (MacLean, Cass, Alesen) with Dr. Frank A. Dickinson of the A.M.A. on this subject. Dr. Dickinson's initial reaction was that such a fee schedule, while difficult to arrive at, would be extremely valuable. On motion duly made and seconded, it was voted to appropriate $15,000 for the purposes of such a study to be made under proper actuarial guidance through Dr. Cox's committee.

8. *Committee on Clinical Material for Teaching Hospitals:*

Dr. Conrad Baumgartner reported for the Committee on Clinical Material for Teaching Hospitals and pointed out that some teaching hospitals are now admitting teaching cases where the patient is covered with hospital and/or medical care insurance. A motion to table the recommendations of the committee was made and seconded but lost on vote. It was regularly moved, seconded and voted to refer the question to the committee for further study.

9. *Proposed Medical Economics Studies:*

Dr. Russel V. Lee reported on a proposal he had previously made to a member of the Legislature that a study of medical economics be undertaken, financed by the state and under auspices of the School of Business of Stanford University. He recommended that the Council approve such a study, whether or not it originated in state legislation.

Dr. Lee discussed a plan of insurance and requested the Council's advice thereon.

It was moved, seconded and voted that copies of two letters prepared by Dr. Lee on these two subjects be sent to members of the Executive Committee for their study and report to the Council.

10. *State Department of Public Health:*

Dr. Wilton L. Halverson, Director of Public Health, reported on his success in securing amendments to the statement of principles of the Section on Medical Care of the American Public Health Association. He was complimented on this action.

Dr. Halverson discussed proposed new hospital regulations which would include, among other things, the regulation of "Industrial and/or Emergency Hospitals or Clinics." The State Board of Health has not yet acted upon this portion of the proposed hospital regulations. After discussion it was moved, seconded and voted that this portion of the hospital regulations be not put into effect at this time, on the ground that existing statutes covering the subject of practicing under a fictitious name could control any abuses by such offices.

Dr. Halverson also reported on legislation proposed by his department, including several changes in the clinical laboratory laws, a smog research study under a $150,000 appropriation and a chronic disease study program under a $50,000 appropriation. General support of this program, with the exception of certain portions of the laboratory proposals and the chronic disease program, was expressed. The chairman notified Dr. Halverson that the Council had withdrawn its support of the proposed chronic disease study.

11. *Committee on Emergency Medical Service:*

Dr. Justin J. Stein, chairman of the Committee on Emergency Medical Service, reported on legislation now pending which would (1) place a physician on the State Disaster Council and (2) permit temporary licensure of out-of-state physicians and other professional personnel in event of emergency. Upon receipt of information from legal counsel, it was the sense of the Council that it was not necessary to issue temporary licenses to physicians but that emergency needs could be fully met in other ways; Mr. Hassard agreed to send Dr. Stein a memorandum to that effect.

Dr. Stein requested authority to hold a one-day meeting of county emergency medical service committee members and a motion was made, seconded and voted to authorize the conduct of such a meeting at an expense not to exceed $1,000.

On motion duly made and seconded, it was voted to authorize the chairman of the committee to confer with the Committee on Postgraduate Activities relative to the inclusion of speakers on civil defense in postgraduate programs, where such speakers are requested by local groups.

On motion duly made and seconded, it was voted to approve a statement by the committee relative to the inadvisability of mass immunization programs where conditions did not positively indicate the advisability of such procedures.

12. *Committee on Public Health and Public Agencies:*

Dr. Alesen referred to the report of the committee which was presented at the preceding meeting for study. On motion duly made and seconded it was voted to approve the philosophy of the report and to approve the activities of the committee to date.

Dr. Daniels reported on a conference with representatives of the State Department of Health and the California Tuberculosis and Health Association relative to cooperative survey of the health facilities of Mendocino County. The county medical society has indicated its approval of such a survey and on Dr. Daniels' recommendation, it was moved, seconded and voted that the Association cooperate in this survey, under the guidance of the Chronic Disease Committee.

Dr. West reported on meetings with representatives of the National Foundation for Infantile Paralysis, stated that further meetings were to be held and indicated hope for an equitable settlement of the question of compensation to physicians treating polio cases.

13. *Public Relations:*

Mr. Whitaker reported that a chiropractic initiative measure which had been circulated had apparently been discontinued.

He also reported that plans are under way nationally for a drive for endorsement against compulsory health insurance among selected groups and

on motion duly made and seconded he was authorized to prepare a presentation of such plans for Council consideration.

Mr. Whitaker commented on the proposed public relations program of the Advisory Planning Committee, pointing out that the basis of the program appeared entirely sound but that in the opinion of some observers the series of newspaper advertisements must occupy dominating space on the newspaper page.

14. *Advisory Planning Committee:*

Mr. Hunton reported on the January 26 meeting of the Advisory Planning Committee, at which time the committee asked that the Council give its approval to the theory of the program, so that a subcommittee could be appointed to work out details for presentation to the Executive Committee and the Committee on Medical Economics. On motion duly made and seconded, it was voted to approve the program in principle and authorize the committee to proceed on its detailing for subsequent approval.

Mr. Hunton also reported the decision of the committee in favor of issuing a news report to all Association members at monthly intervals, including in such letter all matters of current interest, at a cost not to exceed about $800 per issue. On motion duly made and seconded, it was voted to approve such publication.

15. *Blood Bank Commission:*

Dr. West reported on the first month's operation of the San Diego Blood Bank. He asked that the balance of the C.M.A. loan be made available to the blood bank, to carry it over its initial period when collections are slow. On motion duly made and seconded, it was voted to notify the San Diego Blood Bank that the C.M.A. Councilor in that district will serve as a liaison officer between the blood bank and the Association.

16. *White House Conference on Children and Youth:*

Dr. Hartzell Ray reported on his attendance at the White House Conference on Children and Youth and listed his observations of potentially resultant programs in the fields of social security legislation and various proposals for free meals, transportation and other services to all school children, regardless of need.

17. *Committee on Scientific Work:*

Dr. Daniels listed the guest speakers and nonmembers on the scientific program for the 1951 Annual Session and it was duly moved, seconded and voted to approve this list.

18. *Cancer Commission:*

Dr. Daniels presented a proposed program of cancer detection worked out between the Cancer Comission and the American Cancer Society. It was regularly moved, seconded and voted to approve this program.

19. *Secretarial Conference:*

It was moved, seconded and voted to hold a conference of county society secretaries in conjunction with a meeting of the Council, in San Francisco on March 17-18, 1951.

20. *San Francisco Medical Society Charter:*

A request was presented for Council approval of issuance of a new charter to the San Francisco Medical Society, formerly San Francisco County Medical Society. On motion duly made and seconded, it was voted to recommend to the House of Delegates the issuance of a charter under the new name.

21. *World Medical Associations*

On motion duly made and seconded, it was voted to contribute the annual amount of $1,000 to the World Medical Association.

22. *American Public Health Association:*

On motion duly made and seconded, it was voted to take out an individual annual contributing membership in the American Public Health Association, Western Division, in the amount of $100.

23. *California Taxpayers' Association:*

On motion duly made and seconded, it was voted to refer to the Executive Committee the request of the California Taxpayers' Association for a contribution to its work.

24. *California Academy of General Practice:*

On motion duly made and seconded, it was voted to permit the California Academy of General Practice to use the Association's mailing list to send announcements of a coming annual meeting to all C.M.A. members.

25. *Survey of Medical Technicians:*

On motion duly made and seconded, it was voted to table a request for funds to perform a survey of medical technicians.

26. *American Medical Education Foundation:*

On motion duly made and seconded, it was voted that it be the sense of the Council that the Association contribute to the American Medical Education Foundation, an organization sponsored by the American Medical Association, to assist medical schools and medical education, the amount of the contribution to be decided by the Executive Committee after consultation with officers in those county medical societies that can be quickly reached. An amendment to the original motion was made, seconded and adopted, providing that the amount of the contribution be in the neighborhood of $100,000. A second amendment, to provide for approval by the House of Delegates before any sum was decided, was moved and seconded but lost on vote.

27. *Health Insurance Council:*

Mr. Hassard discussed a request received from the Health Insurance Council, representing the insurance companies underwriting voluntary disability insurance, for discussions of the principle of physi-

cians' agreeing to accept indemnity allowances to policyholders as full fees for policyholders below an accepted income ceiling. It was regularly moved, seconded and voted to authorize the previous committee on this subject (Lum, chairman; Ray and Ball) to continue its exploration of this matter and to confer with the Health Insurance Council.

28. *Legal Department:*

Mr. Hassard reported on several pending legal cases of importance to the medical profession.

Adjournment:

There being no further business to come before the meeting, it was adjourned at 8 p.m.

SIDNEY J. SHIPMAN, M.D., *Chairman*
ALBERT C. DANIELS, M.D., *Secretary*

In Memoriam

ANDERSON, CLYDE MAXWELL. Died in Los Angeles, November 21, 1950, aged 64, of coronary occlusion. Graduate of the Medico-Chirurgical College of Philadelphia, 1915. Licensed in California in 1920. Doctor Anderson was a member of the Los Angeles County Medical Association, a life member of the California Medical Association, and a Fellow of the American Medical Association.

✤

BANKS, ALFRED E. Died in San Diego, January 16, 1951, aged 70. Graduate of the College of Physicians and Surgeons of San Francisco, 1904. Licensed in California in 1904. Doctor Banks was a member of the San Diego County Medical Society, and a retired member of the California Medical Association.

✤

BEATTY, JAMES D. Died in Los Angeles, January 3, 1951, aged 71. Graduate of Washington University School of Medicine, St. Louis, 1901. Licensed in California in 1909. Doctor Beatty was a retired member of the Los Angeles County Medical Association, the California Medical Association, and an Associate Fellow of the American Medical Association.

✤

BRAMHALL, ROBERT N. Died in Fair Oaks, December 16, 1950, aged 72. Graduate of Northwestern University Medical School, Chicago, 1902. Licensed in California in 1902. Doctor Bramhall was a retired member of the Sacramento Society for Medical Improvement, the California Medical Association, and a Fellow of the American Medical Association.

✤

BURLEW, JESSE M. Died in Glendale, December 8, 1950, aged 76. Graduate of Rush Medical College, Chicago, 1903. Licensed in California in 1904. Doctor Burlew was a retired member of the Orange County Medical Association, the California Medical Association, and an Associate Fellow of the American Medical Association.

✤

CLARK, CARL W. Died in San Francisco, February 10, 1951, aged 63, of cerebral thrombosis. Graduate of Rush Medical College, Chicago, 1915. Licensed in California in 1923. Doctor Clark was a member of the Marin County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

CUNNINGHAM, TERENCE THOMAS. Died in Lynwood, December 12, 1950, aged 60, of coronary occlusion. Graduate of Rush Medical College, Chicago, 1925. Licensed in California in 1927. Doctor Cunningham was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

FISHER, WARD L. Died in Pomona, January 29, 1951, aged 63, of coronary occlusion. Graduate of the University of Southern California School of Medicine, Los Angeles, 1914. Licensed in California in 1914. Doctor Fisher was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

HARDING, CARL W. Died in Los Angeles, December 27, 1950, aged 47. Graduate of the University of Kansas School of Medicine, Lawrence-Kansas City, 1937. Licensed in California in 1946. Doctor Harding was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

HASTINGS, SEMAN W. Died in Monterey, January 19, 1951, aged 74, after an extended illness. Graduate of the University of Southern California School of Medicine, Los Angeles, 1908. Licensed in California in 1908. Doctor Hastings was a member of the Monterey County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

JACOBUS, LAWRENCE RUSSELL. Died in Oakland, December 31, 1950, aged 52, of acute myocardial infarction. Graduate of the University of California Medical School, Berkeley-San Francisco, 1926. Licensed in California in 1926. Doctor Jacobus was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

KREVITT, JULIUS M. Died in Bakersfield, November 22, 1950, aged 43, of coronary thrombosis. Graduate of the University of Illinois College of Medicine, Chicago, 1934. Licensed in California in 1936. Doctor Krevitt was a member of the Kern County Medical Society, the California Medical Association, and the American Medical Association.

✤

KUDER, WILLIAM S. Died in Oakland, January 29, 1951, aged 69. Graduate of the University of Pennsylvania School of Medicine, Philadelphia, 1904. Licensed in California in 1910. Doctor Kuder was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

LAUGHON, WILLIAM I. Died in Torrance, December 25, 1950, aged 62, of adrenal insufficiency. Graduate of the Medical College of Virginia, Richmond, 1917. Licensed in California in 1930. Doctor Laughon was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

MCDONNELL, CLARENCE H. Died in Sacramento, October 22, 1950, aged 71, of coronary sclerosis and mitral stenosis. Graduate of Barnes Medical College, St. Louis, 1909. Licensed in California in 1909. Doctor McDonnell was a retired

member of the Sacramento Society for Medical Improvement, the California Medical Association, and a Fellow of the American Medical Association.

✤

McGRATH, LEON W. Died in Mission Beach, December 12, 1950, aged 60, of carcinoma. Graduate of the Medical College of the State of South Carolina, Charleston, 1916. Licensed in California in 1939. Doctor McGrath was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

MOFFITT, HERBERT C. Died in San Francisco, February 5, 1951, aged 83. Graduate of Harvard Medical School, Boston, 1894. Licensed in California in 1897. Doctor Moffitt was a member of the San Francisco Medical Association, a retired member of the California Medical Association, and a Fellow of the American Medical Association.

✤

OLDENBOURG, LOUISE A. Died in Oakland, January 30, 1951, of coronary thrombosis. Graduate of the University of California Medical School, Berkeley-San Francisco, 1897. Licensed in California in 1897. Doctor Oldenbourg was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

REUD, WILLIAM R. Died in Oakland, January 28, 1951, aged 83. Graduate of the College of Physicians and Surgeons of San Francisco, 1908. Licensed in California in 1909. Doctor Reud was a member of the Alameda-Contra Costa Medical Association, a life member of the California Medical Association, and a Fellow of the American Medical Association.

✤

ROSENCRANTZ, ESTHER. Died in San Francisco, December 18, 1950, aged 74. Graduate of Johns Hopkins University School of Medicine, Baltimore, 1904. Licensed in California in 1904. Doctor Rosencrantz was a member of the San Francisco Medical Society, the California Medical Association, and an Associate Fellow of the American Medical Association.

✤

SMITH, BENJAMIN H. Died in Los Angeles, December 13, 1950, aged 82. Graduate of Missouri Medical College, St. Louis, 1889. Licensed in California in 1923. Doctor Smith was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

✤

SMITH, KIRBY B. Died in Oakland, January 12, 1951, aged 82, of myocarditis from arteriosclerosis. Graduate of Cooper Medical College, San Francisco, 1896. Licensed in California in 1896. Doctor Smith was a member of the Alameda-Contra Costa Medical Association, a life member of the California Medical Association, and a Fellow of the American Medical Association.

✤

WEINBERGER, JOSEPH. Died in San Francisco, December 31, 1950, aged 62, of a coronary. Graduate of the University of Colorado School of Medicine, Denver, 1911. Licensed in California in 1921. Doctor Weinberger was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Questions and Answers about C. P. S.

Question: **Does C.P.S. exclude plastic surgery?**

Answer: No, plastic surgery is not excluded from C.P.S. contracts, except when it is done for cosmetic purposes. C.P.S. provides coverage for active illnesses and injuries—not for beautification procedures.

Question: **Does C.P.S. still have waiting periods?**

Answer: Waiting periods have been removed for those enrolled in groups, except for the normal waiting period for maternity benefits; the individual family plan also has waiting periods for several specified conditions.

Question: **Do age limits still apply in C.P.S. contracts?**

Answer: In the individual family plan the age limit of 60 years *at time of joining* still applies, although membership may be continued after age 60 is reached. In group contracts all age limits have been removed, providing the persons enroll when first eligible. If a person who is 60 or more does not enroll in a C.P.S. group when first eligible, he is not permitted to do so at a later date.

Question: **Does a wife, as the employee member of a two-visit-deductible contract, who has not added her husband to the hospital portion of the coverage, obtain any hospital benefits in an obstetrical case?**

Answer: No, C.P.S. hospital benefits in maternity cases are paid only when there is at least a two-party contract which has been in effect for the period of ten months or more (nine months under new-type contracts). However, the terms of the medical contract do apply for the physician's professional services in connection with the maternity up to the limits stated in the contract.

Question: **If a physician-member, or one of his staff, desires to join C.P.S. as a beneficiary, is he obliged to accept membership under the individual family plan?**

Answer: No. C.P.S. has established a special "professional group" in which all physician-members may enroll for prepaid health benefits. The privilege of enrolling in this group also is extended to regular employees on the physician's staff (nurses, technicians, secretaries, receptionists, etc.) and to the family dependents of the physician and his staff employees. Dues for membership in this group are handled on a "direct pay" basis and are payable quarterly, semi-annually or annually. The basic coverage provided for all is the surgical contract and the 50-day hospital contract. In addition, physician-members and employees may, if desired, have either the two-visit-deductible medical contract or medical-services-while-hospitalized; dependents, if desired, may have medical-services-while-hospitalized; all may add "catastrophic coverage," if desired.

Question: **What should we tell our patients who inquire as to the availability of individual memberships?**

Answer: It is requested that physicians refer these patients to the headquarters offices of C.P.S. in either Los Angeles or San Francisco, or to any C.P.S. district office. However, upon request from a physician-member, C.P.S. will furnish him with a supply of descriptive literature and application forms for the individual family plan, which may be presented to interested patients.

Question: **Why does C.P.S., on group contracts, sometimes reject applicants and/or place limitations on specified ailments for a certain member?**

Answer: In its early stages of development, C.P.S. had to learn many things about prepaid health coverage by the trial and error method. One of the lessons learned was: When persons do not join C.P.S. when membership is first available, they usually join later only when it becomes apparent to them that they are in need of an operation or other medical care.

Thus, C.P.S. adopted the following policy: All employees of a group are eligible to join when the group is formed, and all persons who are employed later may join C.P.S. within a reasonable time after commencing employment in the group. Those who forego this opportunity to join C.P.S., and decide to enroll at some later date, are not barred from membership, but are required to complete a health statement. The information contained on the health statement determines their eligibility for membership or limitation of coverage for a certain condition.

As can be seen, this policy was adopted to limit costly abuses of membership which, in the aggregate, would impair C.P.S. finances. Maintenance of the policy contributes to the goal of higher fees to physician-members.

Question: **Are peacetime veterans eligible for medical treatment through the Veterans' Home Town Care Program?**

Answer: Yes, for service-connected disabilities, if the veteran is receiving compensation from the Veterans Administration for a service-connected disability and was discharged under honorable conditions.

Question: **If I treat a veteran who alleges service-connection for a disability, and subsequently my request is denied on the grounds of non-service-connection, may I bill the veteran for these services?**

Answer: Yes. Even the first examination, which was necessary to arrive at the diagnosis which was ruled non-service-connected, should be the responsibility of the veteran.

Question: A man has a cold which develops into bronchitis, sinusitis and pneumonia. Three or four months are required for recovery. Three years later he has a recurrent bronchitis, but is not allowed C.P.S. benefits for the recurrence. Why?

Answer: Old C.P.S. contracts specifically state that medical care is limited to three consecutive months for any chronic or recurrent condition, including any and all complications and recurrences. In new contracts, currently being introduced, this stipulation has been revised as follows: Medical benefits are provided for three consecutive months for all non-surgical professional services, except for a number of listed ailments for which one year's care is provided.

Executive Secretaries Impressed by C. P. S. Efficiency

Beneficial results achieved by the Conference of Executive Secretaries, recently conducted by California Physicians' Service at its San Francisco offices, are impressively revealed in reports written by various executive secretaries who attended the two-day meeting.

Purpose of the conference was to promote closer working relations between C.P.S. and county medical societies and to bring a fuller understanding of mutual problems and programs.

Writing in the bulletin of the Fresno County Medical Society, Glenn W. Gillette, executive secretary of the Fresno society, said: "California Physicians' Service is a well-organized, efficient and going concern."

Robert L. Wood, Jr., executive secretary of the San Mateo County Medical Society, in a letter to W. M. Bowman, C.P.S. executive director, said: "Your physical plant is a marvel to behold . . . and surely pays off in speed, accuracy and efficiency."

K. C. Young, executive secretary of the San Diego County Medical Society, wrote in his society's bulletin: "I was particularly impressed with the earnest manner in which C.P.S. attempts to please its 10,700 physician members. No complaint is unheeded, a sincere effort is made to satisfy everyone."

In addition to executive secretaries, the conference also was attended by representatives of the California Medical Association and the Public Health League.

Following a complete examination of C.P.S. offices, highlighted by explanations of departmental functions, the visitors engaged in roundtable discussions conducted by Mr. Bowman and C.P.S. department supervisors. Topics included physician relations, new contracts and conversion of old contracts, statistical studies, special review committees, the fee schedule, the income clause, sales procedures, veterans' program and administration.

Continuing his report, Gillette pointed out: "Each department within C.P.S. works under a budget and all general accounts are audited twice annually. Administrative expenses amount to a modest 12 per cent, highly favorable particularly in that the figure includes sales. . . . The nurse instruction courses now being held throughout the state are improving doctor-patient relationships. . . . The review committees (one in each county medical society) are funneling worthwhile suggestions to the medical department.

"C.P.S. has made, and is making, greater strides in the field of voluntary health insurance than the average busy physician realizes. To make constructive suggestions is the right of every member physician [and] the success of C.P.S. depends on the amount and direction of the individual physician's participation."

Further comments by Mr. Wood included: "I have gained a new respect for the whole program and was able to report most enthusiastically to my board of directors. . . . Your efforts to put all contracts on a paying basis are commendable. . . . It [C.P.S.] should never be construed as a source of wealth for the profession. However, every effort should be continued to pay full fee schedules as soon as possible."

Mr. Young was indelibly impressed by the actuarial work done in C.P.S. "C.P.S. leaves little to chance, everything is carefully calculated to five decimal points," he said. "From I.B.M. machines come every conceivable type of statistical information. . . . The administration knows at all times exactly which of many contracts is earning money and which is losing . . . and how much each medical procedure is costing. . . . Such information is of vital importance to safe financial operations because an unusual, protracted utilization of any medical procedure could upset the whole plan if not anticipated."

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Dr. Donald W. Blanche last month was installed as president of the Los Angeles chapter of the Western Orthopedic Association. Other officers elected at the same time are: Dr. John Manning, president-elect; Dr. Charles Gilfillan, vice-president; and Dr. Walter Scott, secretary-treasurer.

SACRAMENTO

More than 200 physicians from 17 counties in Northern California attended the first annual **regional medical and surgical convention** which was held February 8 and 9 under the sponsorship of the Sacramento Society for Medical Improvement. The program was arranged by the Committee on Postgraduate Activities of the California Medical Association, and the faculty for the two-day session was drawn from Stanford University School of Medicine.

The meeting was one of a series arranged by the C.M.A. Postgraduate Activities Committee in cooperation with county medical associations in various parts of the state.

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Dr. John Rovane recently was elected president of the Sacramento chapter of the American Academy of General Practice, succeeding Dr. John Long. Dr. Morris Jones was elected vice-president.

SAN DIEGO

Dr. Sam J. McClendon, San Diego, recently was appointed by Governor Earl Warren to serve a second four-year term on the State Board of Public Health.

GENERAL

Dr. Wilbur Bailey of Los Angeles and **Dr. Clayton Mote,** San Francisco, have been reappointed to the State Board of Medical Examiners for four-year terms by Governor Earl Warren. Both physicians have served on the board since 1947, and Dr. Bailey recently was elected president of it.

* * *

The fourth annual **Postgraduate Course in Diseases of the Chest,** sponsored by the American College of Chest Physicians, Pennsylvania chapter, and the Laennec Society of Philadelphia, will be presented at the Hotel Warwick, Philadelphia, March 26 to 30, 1951. The course is open to all physicians but the number of registrants will be limited. The tuition fee is $50.00. Applications should be sent to the American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

* * *

Dr. Elmer L. Henderson, president of the American Medical Association, last month was unanimously elected president of the new **American Medical Education Foundation** which is raising funds within the medical profession for the unrestricted use of the nation's hard-pressed medical schools.

The Foundation was founded at the December 1950 meeting of the American Medical Association in Cleveland when the Board of Trustees announced an appropriation of one-half million dollars as the nucleus of a fund to be raised by the medical profession to assist medical schools. Many further contributions have been received so far, including one for $100,000 from the California Medical Association. "California is the first state medical association to make such a contribution, but it is expected that other state societies will follow," the Foundation said.

Plans have been initiated to form Foundation committees within the 53 component state and territorial medical societies as well as within each county and district medical society. These committees will canvass the physicians in their own areas for funds. The aim of the Foundation is to raise within the next few months a fund sufficiently large so that grants can be disbursed to medical schools this year with as little delay as possible.

It was pointed out that a contributing physician may, if he wishes, earmark his contribution for a specific medical school. As the A.M.A. has agreed to underwrite all expenses in connection with the Foundation, "every dollar contributed will go to the medical schools," it was announced.

* * *

The 1951 meeting of the **American Goiter Association** will be held in the Deschler-Wallick Hotel, Columbus, Ohio, May 24 to 26.

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The date for the third **Western Institute on Epilepsy,** which will be held in Salt Lake City, has been changed from the weekend of June 15 to 17 to the weekend of June 22 to 24, according to an announcement by the Institute.

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The fifth of a series of seven section meetings of the **American College of Surgeons** will be held in Portland, Oregon, March 26 and 27, with headquarters at Hotel Multnomah. The Portland meeting will be followed by meetings in Denver, April 6-7, and in Detroit, May 10-11.

* * *

The program for the **California chapter of the American College of Chest Physicians,** which is to hold its annual meeting in Los Angeles, Saturday, May 12, the day before the opening of the Annual Session of the California Medical Association, is as follows:

AMBASSADOR HOTEL, GOLD ROOM

Morning Session

Moderator, J. J. SINGER, M.D.

9:00—Cortisone and ACTH in Tuberculosis—David Salkin, M.D., Sol Netzer, M.D., and Emil Bogen, M.D.

9:20—BCG Vaccination in Pulmonary Sarcoidosis—Marvin S. Harris, M.D.

9:40—The Clinical Application of the Warring Test for Pulmonary Ventilatory Function—Harold Guyon Trimble, M.D., and James R. Wood, M.D.

10:00—Radiological Findings in Early Carcinoma of the Lung—Eugene Freedman, M.D., and James H. Billings, M.D.

10:20—Treatment of Abscesses Associated with Spinal Tuberculosis—John H. Aldes, M.D.

POSTGRADUATE EDUCATION NOTICES

For more complete information as to fees and time of sessions address the institutions as listed.

STANFORD UNIVERSITY, SCHOOL OF MEDICINE, San Francisco 15

Clinical Ophthalmology—March 26 to March 30. Registration limited to 30 physicians limiting their practice to the treatment of diseases of the eye or eye, ear, nose and throat.

Address: Office of the Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

THE COLLEGE OF MEDICAL EVANGELISTS

Histology and Histopathology of the Eye—February 28 through June 20, 1951.

Varicose Veins—March 1 to April 5, 1951.

10:40—The Management of Esophageal Perforations—David J. Dugan, M.D.

11:00—The Surgical Treatment of Certain Asymptomatic Intrathoracic Lesions Discovered by Roentgen Examination—Lyman A. Brewer, III, M.D.

11:20—The Repair of Experimental Tracheal Defects with Fresh and Preserved Homologous Tracheal Grafts—Orland G. Davies, M.D., J. Malcolm Edmiston, M.D., and H. J. McCorkle, M.D.

11:40—Extracorporeal Oxygenation of Blood — Joseph H. Miller, M.D.

Luncheon

Moderator, SEYMOUR M. FARBER, M.D.

Pulmonary Resection—Charles P. Bailey, M.D.

Afternoon Session

Moderator, LYMAN BREWER, III, M.D.

2:00—Diagnosis of Congenital Heart Disease — William Paul Thompson, M.D.

2:20—Cardiac Catheterization in Surgical Heart Disease—Sidney S. Sobin, Ph.D., M.D., and Louis E. Martin, M.D.

2:40—Transposition of Pulmonary Veins; Report of Five Cases Diagnosed by Cardiac Catheterization—David C. Levinson, M.D., R. S. Cosby, M.D., Willard Zinn, M.D., Sima P. Dimitroff, M.D., Robert Oblath, M.D., Telfa Reynolds, M.D., and George C. Griffith, M.D.

3:00—Auricular Paroxysmal Tachycardia in Man During Thoracic Surgery—Eliot Corday, M.D., Alfred Goldman, M.D., Robert W. Oblath, M.D., and Myron Prinzmetal, M.D.

3:20—Intracardiac Digital Surgery — Charles P. Bailey, M.D., Robert P. Glover, M.D., Thomas J. E. O'Neill, M.D., and Marvin M. Lacy, M.D.

4:00—Coarctation of the Aorta—Bert Meyer, M.D., and John C. Jones, M.D.

4:20—The Surgical Treatment of Valvular Pulmonic Stenosis—William H. Muller, Jr., M.D.

* * *

The Moore-White Clinic, Los Angeles, recently announced that it is now receiving applications for the 1951 **Fellowship in General Practice.** The fellowship is designed to offer advanced training in medicine and surgery for recent graduates planning to enter general practice, and includes services in internal medicine, general surgery, obstetrics and gynecology, urology, orthopedics, pediatrics, otolaryngology, radiology, and laboratory diagnosis.

The period of appointment is for one year, beginning July 1 of each year. Stipend will be $3,000 and transportation allowance.

Prerequisites of candidacy include graduation from a Class A medical school, one-year internship, and license to practice medicine in California. Those interested in further information or in making application should apply to: Committee on Fellowships, The Moore-White Clinic, 511 South Bonnie Brae Street, Los Angeles 5, California.

* * *

A San Francisco hospital, two medical schools in northern California and one in southern California shared in **awards in support of heart research** which were announced March 1 by the Life Insurance Medical Research Fund. In addition the fund awarded five fellowships for supervised research in California medical training institutions.

Grants in aid of research are as follows:

The Mount Zion Hospital, San Francisco, for research by Dr. Meyer Friedman on the distribution and fate of digitalis glycosides, $8,400.

Stanford University School of Medicine, for research by Dr. Emile Holman on various cardiovascular problems, $7,875.

University of California School of Medicine, for research by Dr. John W. Gofman on fundamental aspects of the association of lipoproteins with arteriosclerosis, $21,000.

University of California School of Medicine, for research by Dr. David M. Greenberg on metabolic changes associated with the development of hypertension and arteriosclerosis, $7,875.

University of California School of Medicine, for research by Dr. John H. Lawrence on total body water in cardiovascular and other diseases, $6,825.

University of California at Los Angeles School of Medicine, for research by Dr. William G. Clark on the biosynthesis and metabolism of adrenalin in relation to hypertension, $12,600.

University of Southern California School of Medicine, for research by Dr. J. Leyden Webb on cellular mechanisms in the action of drugs on the cardiovascular system, $18,900.

Postdoctoral fellowship awards with stipends varying from $3,000 to $4,000, are as follows:

David A. Berman, of Los Angeles, for research under the supervision of Dr. J. Leyden Webb at the University of Southern California School of Medicine.

L. Allen Smith, M.D., of Harrisonville, Missouri, for research under the supervision of Dr. Myron Prinzmetal at the Institute for Medical Research, Cedars of Lebanon Hospital, Los Angeles.

Gordon M. Tomkins, M.D., of Los Angeles, for research under the supervision of Dr. I. L. Chaikoff at the University of California School of Medicine.

Predoctoral fellowships, carrying stipends of $1,800 to $2,000:

Edward Ronwin, M.S., of New York, N. Y., to work under the supervision of Dr. David M. Greenberg at the University of California School of Medicine, Berkeley.

Margret I. Sellers, M.S., of Hayesville, N. C., to work under the supervision of Dr. Gregory J. Jann at the University of California, Los Angeles.

BOOK REVIEWS

THE DIAGNOSIS OF HYSTERIA. By D. W. Abse, M.D., B.Sc., D.P.M., Assistant, Department of Psychiatry, Charing Cross Hospital. The Williams and Wilkins Company, Baltimore, 1950. $2.00.

This small book of 112 pages represents "substantially the contents . . . accepted by the University of Wales as a thesis for the degree of M.D. in 1948." The author feels that the book is a review of the subject of hysteria, which will be of special value to those in Great Britain preparing for the Diploma in Psychological Medicine in the United Kingdom and for those preparing for the M.D. in Psychological Medicine of the Medical Schools in India.

The book in general is a summary of our present knowledge of hysteria with some historical material indicating how these formulations have finally been achieved. The author relies heavily on the orthodox psychoanalytic approach. From the standpoint of the Freudians, however, the formulations appear rather superficial. The claim is made that all hysteria is due to conflict over sex, and great emphasis is laid upon the oedipus complex. A number of case histories are given. It cannot be said that this book adds anything to our knowledge of the subject of hysteria. It gives a brief history of the development of the various ideas that have been held as to the cause of hysteria beginning with Plato and ending up with Freud. Charcot and Janet are given rather more credit than is done by most of the followers of Freud. Jung likewise is quoted a number of times.

The book is clearly and interestingly written and does summarize a good deal of the knowledge that we have about hysteria. Properly the author insists that the diagnosis of hysteria should be on a positive basis and not purely on the basis of negative medical examination.

* * *

PHYSICIANS FEDERAL INCOME TAX GUIDE AND SIMPLIFIED ACCOUNTING RECORD. By Hugh Campbell and James B. Liberman. For the preparation of 1950 returns and 1951 estimates. Doniger and Raughley, Inc., Great Neck, New York, 1950. $2.50.

"Physicians Federal Income Tax Guide and Simplified Accounting Record" is well written, and in non-technical terms that may easily be understood by physicians, for whom the book was intended.

"Non-Taxable Income, Professional Deductions, and Personal Deductions" are clearly set forth in the beginning of the book, together with a 1951 Tax Calendar. One section is devoted to a general discussion on how to use the book; a second section to the actual filling out of the income tax return; a section on the declaration of estimated tax; one on the physician as an employer; and the last on the simplified accounting record.

With careful study of this book, the physician should not have any difficulty in preparing his Federal Income Tax Return, as this book covers every problem that he is likely to encounter.

The "Simplified Accounting Record," however, appears to have been over-simplified, and certainly does not take the place of adequate detailed financial records, as it is a mere summary and is usually a part of any "log" or "daily record."

The use of additional examples and the keying-in of the text material to the completed specimen return which is included in Chapter 25 would have improved the book.

LORD LISTER, HIS LIFE AND DOCTRINE. By Douglas Guthrie. The Williams and Wilkins Company, Baltimore, 1950. $3.50.

A small, 128-page book acknowledges a considerable debt to Lister's biography by his nephew, Sir Rickman Godlee, but is supplemented by additional material from other associates and confreres. Following graduation at University College in London, his activities in successive academic posts are carried through Edinburgh, Glasgow, then back to Edinburgh and finally to London at Kings College Hospital. His persistence in the face of criticism, misinterpretation and active opposition to his work without the development of bitterness, and above all his humility and teachableness are emphasized.

The chapters dealing with the justification of his scientific work up to the final ones covering his relationship to Pasteur and Koch include his American trips. One wishes that the details of his visit to San Francisco were given.

Altogether this little volume is most readable and particularly suitable for the overburdened medical student because of its compactness. Its inclusion of the essentials of Lister's scientific efforts and of his high personal qualities cannot fail to stimulate and afford a pattern to all.

* * *

NON-GONOCOCCAL URETHRITIS — Including the Genital Manifestations of Local and Systemic Diseases and Infestations of the Urinary Tract with Protozoa, Metazoa and Fungi. By A. H. Harkness, M.R.C.S., L.R.C.P., Joint Director of the Endell Street Clinic, St. Peter's and St. Paul's Hospital (Institute of Urology); Vice-President (Past President) of the British Society for the Study of Venereal Disease. 167 Illustrations, 73 in Full Color. The Williams and Wilkins Company, Baltimore, 1950. $10.00.

Harkness' book is an encyclopedia of the subject of urethritis. The entire field of non-gonococcal infections of the urethra, a subject about which little is generally known, is covered in a comprehensive, scholarly manner.

The problem of treating these cases has recently become more prominent. The incidence of gonorrhea has decreased greatly since the advent of penicillin, with an apparent increase in non-gonococcal urethritis, which makes this book timely. This change is partly due to the increased number of cases of non-gonococcal discharge, revealed after specific therapy for gonorrhea, that previously have been resolved unnoticed during the long irrigation treatment.

Non-gonococcal urethritis has been a baffling and often mistreated disease in our armed forces. This volume will be welcomed by our medical officers, as heretofore this type of urethritis was so long drawn out and so unsatisfactory to treat and caused so much worry that occasionally even the psychiatrist was consulted.

The book is well written, and the subject matter is dealt with thoroughly. The non-gonococcal agents causing urethritis—food, water, protozoa, fungi, diabetes, pellagra and the "L" organism, are baffling in their number and variety. A number of chapters covering such diseases as diphtheritic urethritis and Reiter's disease are all-inclusive monographs. The etiology, bacteriology, diagnosis and treatment are discussed completely, and all chapters are followed by a full bibliography.

This single volume is of a size easy to handle, printed with clear type on glossy paper. There are 167 illustrations, 73 in full color, most of which are good and clearly depict their

subject. The book is of value to the urologist as well as to the general practitioner and would well repay considerable study.

While non-gonorrheal urethritis is a rare disease and is frequently mistakenly diagnosed and difficult to treat, it is a condition that responds readily to correct therapy. Harkness' work will make a valuable and satisfying addition to the library of anyone who is occasionally called on to diagnose urethritis of any origin.

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THE PHYSICIAN EXAMINES THE BIBLE. By C. Raimer Smith, B.S., M.D., D.N.B., Philosophical Library, 15 East 40th Street, New York, N. Y., 1950. $4.25.

Even though this book is not written for the exclusive use of physicians, it is written by one and can be accepted as having a direct application to the broad field of medicine.

It is obvious that the author has a sincere objective in producing this thesis. In the summary he expresses it as follows: "Man stands at the gate of a new age. He hesitates. He questions. Shall he take the Bible with him across the portal as a priceless treasure, or shall he cast it aside as some useless rubbish?"

Further, it is obvious that the material which is presented and the conclusions which are made are the results of the study of a lifetime. Along with many doctors of medicine and men of science he has compared "religion" with "science." Obviously he has had his doubts, but differing from many he was not willing to "cast way" the one in favor of the other as do so many religionists and scientists alike, because of prejudice and ignorance. He has not weighed all the evidence; nevertheless, he has done well and has reached a satisfactory conclusion for himself. This conclusion, the evidence for which is well stated, is that the Book of Books is a "pearl of great price," the concepts of which are not only advisable but also essential to the successful continuance of civilization, if not the existence of the human race.

The first portion of the book touches upon many of the biblical references to medical topics, the relative accuracy of which are supported by comparisons with current scientific knowledge. Nevertheless, the author had the good sense to recognize the Bible as a book the purpose of which is primarily to emphasize essential moral values, rather than to consider it as a treatise on things scientific.

The latter portion of the book covers the true purpose for its publication; namely, to support the concept that the Creator of natural phenomena and the Creator of the ethical and spiritual codes by which man must live if he is to live successfully, is the same God.

The reason why scientists and religionists so frequently disagree is because of prejudices which exist between them. The author emphasizes the fact that such disagreement has long existed, particularly during the Era of Christianity, but that there has never been any real reason except ignorance or the stubborn dogma of certain religious leaders or misinterpretation by the scientist himself.

Even though the writer disagrees with the author of the book on some points, believing he has not adequately correlated scientific evidence with statements made in the Bible in developing some of the opinions which he holds, nevertheless the writer agrees with the author in his opinion that, when all evidence is weighed there exists no difference between biblical concepts and well-substantiated scientific facts which cannot be explained by the inability of human scribes adequately to express themselves on subjects with which they may have been quite unfamiliar.

Regardless of one's current concepts of the Bible and of God and of His relationship to this world, one can read this book with interest and, if the author has accomplished his objective, with profit.

INTER-ALLIED CONFERENCES ON WAR MEDICINE, 1942-1945, Convened by the Royal Society of Medicine; Honorary Editor: Major-General Sir Henry Letheby Tidy, K.B.E., M.D., President of the Inter-Allied Conferences, Lately Consulting Physician to the British Army, Assistant Editor: J. M. Browne Kutschbach, M.B., B.Ch., D.P.H.; Staples Press Limited, New York, 1950. $5.00.

This volume will bring a certain amount of nostalgia to those of us who served in the European Theater of Operations between 1942 and 1945. It records 120 of the 220 communications which were delivered at the meetings held at the Royal Society of Medicine in London by the medical services of the Allies stationed in the United Kingdom. The programs which were offered were, in themselves, of considerable interest. The meetings, in addition, will be remembered for the associations which they fostered between American doctors and doctors of other nations.

The book consists of on-the-spot medical war reporting. It is divided into several principal sections. These include general accounts of campaigns, personal experiences of officers in special episodes, the particular experiences connected with D-Day and with German concentration camps, and a variety of special medical subjects. Among these last are malaria, psychological aspects of warfare, the position of advanced surgical teams, infective hepatitis and problems of medical evacuation.

There is perhaps no volume which has assembled as concisely and as well such miscellaneous data on the experience of World War II from the medical viewpoint.

* * *

PSYCHOSOMATIC MEDICINE: ITS PRINCIPLES AND APPLICATIONS. By Franz Alexander, M.D., Director, Chicago Institute for Psychoanalysis, Clinical Professor of Psychiatry, University of Illinois. W. W. Norton & Company, Inc., New York. 300 pp. 1950.

The psychosomatic approach in medicine has become increasingly popular in recent years. Explanations for so-called psychosomatic disorders are often given, however, in such general terms as anxiety, tension, and frustration. But these do little to explain the physiological and organic changes considered to be the result of chronic psychological conflict. The author of this volume draws on psychoanalytic concepts to elucidate the interrelations between psyche and soma. He obviously has had considerable personal experience in this field, and his contributions to the medical literature are many.

In the first section, the role of modern psychiatry in the development of medicine is elaborated. The descriptive psychiatry of Kahlbaum and Kraepelin and the neuroanatomy and neuropathology of Cajal, Golgi, and Alzheimer and Nissel do little to explain the symptomatology of the so-called "functional" psychoses such as schizophrenia, manic-depressive psychosis and the psychoneuroses. The author considers Sigmund Freud to be the first to establish fundamental dynamic principles of psychological causality, and throughout the volume there is little doubt of the author's psychoanalytic bias. There is considerable emphasis on the differentiation between conversion hysteria and vegetative neurosis. A vegetative neurosis (functional disorders of stomach, bowel, and cardiovascular systems) is defined as the physiological response of vegetative organs to constant or periodically returning emotional states, while a conversion symptom (hysteria) is a symbolic expression of an emotionally charged psychological content. It is repeatedly emphasized that the etiology of psychosomatic disorders, as in other medical syndromes, is multicausal and not either organic or psychological. The author's theory of specificity is utilized to explain how certain organs or organic symptoms are utilized in the explanation of symptomatology in that he considers there are specific psychodynamic configurations characteristic of various vegetative disturbances. This is in

contrast to the concept that there is no specific correlation between the nature of emotional stress and its physical sequelae. The emphasis on the concept of specificity is not on personality type, but rather on definite emotional constellations.

The second section is concerned with the description of emotional factors in various syndromes such as gastrointestinal disturbances, respiratory, cardiovascular, skin, metabolic, endocrine, joint and skeletal muscle, and sexual disturbances. Particular stress is placed on descriptions of the emotional patterns of patients suffering from peptic ulcer, ulcerative colitis, bronchial asthma, essential hypertension, thyrotoxicosis, chronic fatigue states, and rheumatoid arthritis. The specific dynamic patterns outlined are perhaps "too pat," but nevertheless they represent a sincere attempt at formulating broad concepts concerning these disorders. The author is to be congratulated on his frankness in reporting that the number of patients who have received psychoanalytic therapy for most of these disorders is too small to permit statistical evaluation of the results of such treatment.

The chapter on therapy is short, but case reports throughout the volume exemplify methods used by the author and some of the good and poor results with psychotherapy. "The psychosomatic approach is more than what has been called bedside manner or medical art. . . . It is based on specific knowledge of the emotional factors operating in every case and of those physiological mechanisms by which emotional factors influence the disease process." It is a persistent and common error among both psychiatrists and internists that if emotional etiology in a case has been established somatic medical management becomes unnecessary and the patient can be turned over completely to a psychiatrist. "Progress in modern medicine consists specifically in the cooperation of the psychiatric and non-psychiatric specialists, both in diagnosis and in treatment."

This is a thorough exposition of the psychosomatic approach in medicine by a psychiatrist who himself has done much original work in the field, and can be very well recommended to every physician.

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HEALTH INSTRUCTION YEARBOOK — 1950. Compiled by Oliver E. Byrd, Ed.D., M.D., F.A.P.H.A., Professor of Health Education, and Director, Department of Hygiene, School of Education, Stanford University. Foreword by Jesse Feiring Williams, M.D., Sc.D., Professor Emeritus, Teachers College, Columbia University, 270 pages. Stanford University Press, Stanford, California, 1950. $3.50.

The eighth Yearbook compiled by Doctor Byrd again serves as a unique digest of highlights in the whole field of health. It is virtually indispensable for instructors in health at secondary schools and colleges as a resource of current authoritative information. If a physician is requested to suggest a source for such instruction, he may recommend this book without hesitation. Indeed, it is very useful for his own reading, in tune with the quickened interest of the individual physician and of organized medicine in the broad panorama of health extending beyond one's own specialized interests.

The author has gleaned 255 articles from the 1,628 he has reviewed. The *Journal of the American Medical Association* leads all others and he comments "this *Journal* must be considered the primary source of health education materials in this country." The material is presented under 21 chapter headings. Each chapter begins, like *California Medicine*, with an italicized summary of its contents. Then follows a succinct review of each selected article. At the end is a bibliography giving the specific reference in the literature to the article. The book represents prodigious amount of work for Doctor Byrd, but is well worth his time and effort.

THE MODERN TREATMENT OF ASTHMA — With Special Reference to Gold Therapy. By L. Banzsky, M.D., L.M.S.S.A. (Lond.). The Williams and Wilkins Company, Baltimore, 1950. $2.50.

The main objective of the author is to present data on gold therapy in the treatment of asthma. Although presentation of the methods used and the precautions necessary in this form of treatment are given in great detail, the reviewer is not convinced of the merits of this therapy. It must be regarded as another form of non-specific treatment of asthma, which in view of the hazards of overdosage does not appear justified except in those cases of chronic asthmas which have not responded to other measures.

Much of the book is a review of old theories and some of the more recent therapeutic measures including the use of antihistaminics and histamine desensitization—the usefulness of which can be better evaluated from reading some of the more recent literature and more comprehensive texts on allergy.

* * *

PYE'S SURGICAL HANDICRAFT—A Manual of Surgical Manipulations, Minor Surgery, and Other Matters Connected With the Work of Surgical Dressers, House Surgeons and Practitioners. By Hamilton Bailey, F.R.C.S. Eng., Surgeon, and Surgeon-in-Charge of the Genito-urinary Department, Royal Northern Hospital, London; 830 Illustrations; The Williams and Wilkins Company, Baltimore, 1950. $6.00.

This practical handbook has been the companion of English house surgeons for generations. Hamilton Bailey has been the editor since 1938, although many contributors have aided him in its preparation. Emergency procedures, bandaging techniques, minor surgery and numerous practical aids in hospital and dispensary practice are offered. This, the sixteenth edition, coming only three years after the last one, has been enlarged and revised; but there are few major changes. American house officers and practitioners will find this a very useful and handy reference book.

* * *

STUDIES IN LOBOTOMY. By Milton Greenblatt, M.D., Robert Arnot, M.D., Harry C. Solomon, M.D., Editors. Grune and Stratton, Inc., New York, 1950. $10.00.

This book will be of particular interest to psychiatrists, neurologists and neurosurgeons. It is a very detailed and thorough study of 205 cases of prefrontal lobotomies performed at the Boston Psychopathic Hospital with a one- to four-year follow-up. The majority of cases were long-standing schizophrenics. Operation was performed only when there was no response to any other type of treatment. Postoperative psychological tests reveal little intellectual loss or evidence of brain damage in these patients in spite of gross frontal lobe destruction. The method of preoperative and postoperative psychiatric evaluation is described. Detailed studies of individual traits on each patient following lobotomy are reported. Postoperative changes for the better were reduction of fear, worry, and depression and improvement in behavior; changes for the worse—reduction of insight and initiative; 105 patients were still hospitalized and there were six surgical deaths. Predictive factors regarding surgical results—good if onset of illness rapid (less than one month), fair if less than four years duration, poor over ten years. Prognosis poor with previous brain damage, auditory hallucinations or poor insight. A few cases of unilateral and bimedial lobotomy were discussed.

The literature is reviewed and there is an excellent bibliography. The status of prefrontal lobotomy is still in a stage of uncertainty and anyone interested in this problem will benefit by the experience of the authors.

MEDICAL JURISPRUDENCE

PEART, BARATY & HASSARD OF THE CALIFORNIA BAR

Hospitals—Res Ipsa Loquitur

In *Cavero v. Franklin Hospital, 36 AC 240,* the Supreme Court of California was presented with the following facts:

Plaintiff brought a wrongful death action for the death of her three-year-old son. Plaintiff's son had entered the hospital for the purpose of having his tonsils and adenoids removed. The patient's tonsils were moderately enlarged and inflamed but were not in an acute condition. The operation was not an unusual case or an emergency, nor did it involve major surgery. When the child was brought into the operating room, he had already been placed in an intermediate or preliminary anesthetic state. After he was placed on the operating table, further ether was administered, first through a mask by drops and later by tube, and by gas causing the ether to bubble through tubes. While the child was in the depths of anesthesia, the doctor started to remove the tonsils. After the second tonsil was removed and the third increase of anesthesia, the doctor noticed that the blood was extremely dark, which meant, according to the doctor's testimony, that there had not been a proper oxygen supply. The doctor immediately applied artificial respiration with his hands and a resuscitator was called for. The machine was not in the room and the anesthetist left the room and returned with it three or four minutes later; meanwhile artificial respiration was continued. The resuscitator was used but failed to revive the child and the doctors were of the opinion that the child had died by the time the machine was brought into the room and that the death resulted from an overdose of ether by the anesthetist. The coroner's autopsy indicated that the child's death was caused by "inspiration of hemorrhagic material." The nurse-anesthetist was paid directly by the hospital and was under the supervision of the defendant hospital.

The defendant hospital contended that as a matter of law the nurse-anesthetist was employed or agent of the defendant doctors rather than of the hospital and that the hospital cannot be responsible for any negligence of such anesthetist. However, the court held that the evidence amply supported the implied finding that the anesthetist was the hospital's employee in the operation here involved.

The court held that an instruction on the res ipsa loquitur doctrine was proper where the evidence established, in the absence of explanation, that the child's death was due to something which ordinarily does not occur in the absence of negligence; that it was caused by an agency or instrumentality within the control of the defendant; and that it was not due to any voluntary action or contribution of either the plaintiff or the child. Thus, in this case, the plaintiff was allowed to recover.

A rehearing in this case was denied by the Supreme Court of California on November 30, 1950.

For the requisites of the doctrine of res ipsa loquitur you are referred to the February issue of CALIFORNIA MEDICINE.